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All communications to be addressed:
"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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G. F. JENKINS,

Minister of Agriculture.

POINTS FOR PRODUCERS.

Brown Heart.

At the instigation of the Agent-General for Tasmania (Mr. A. H. Ashbolt), a conference of representatives of fruit shippers, shipowners, and other interested parties was recently held in London for the purpose of securing definite knowledge as to the cause of Brown Heart in apples. Varying opinions as to the cause of the disease were suggested. After lengthy discussion on the available data, it was decided that an effort should be made to arrive at the cause of the trouble by experimental investigations. Resolutions setting out the nature of these investigations were adopted.

The Fertilisers Act.

Up till 1918, when the present Fertilisers Act was passed, dealers in fertilisers were not compelled to supply buyers with any guarantee or invoice in relation to a quantity of any registered brand of fertiliser that did not weigh half a hundredweight. The omission of this precaution gave rise to various abuses in regard to the sale of fertilisers, more particularly those of a special kind, which were sold at high prices and purporting to contain some extraordinarily valuable constituent. The Act of 1918 repealed this section, and every dealer, whether it be in any specialised fertiliser or any of the ordinary lines which are usually sold in bulk, is called upon to brand each parcel, whether it consists of a pound or two only, with the guarantee minimum of the principal fertilising elements in the same, together with the name of the manufacturer (if of local manufacture), the name and address of the seller, and the net weight of the contents of the parcel. A sale note or invoice to the same effect must also be given to the purchaser. The Horticultural Branch of the Department of Agriculture is charged with the administration of this Act, and the Chief Inspector of Fertilisers states that infringements of these provisions of the Act have become so prevalent that he has notified all the small retailers that in future the observance of the provisions of the law will be insisted upon in all cases.

Superphosphate and Take-all.

A feature revealed by the experimental plots being conducted at Butler by Mr. C. F. Jericho, working in conjunction with the Department of Agriculture, is the apparent effect of heavy dressings of superphosphate as a means of controlling the "take-all" disease of wheat. For five years it has been the practice to grow wheat on a series of plots each receiving different manurial treatment. The average returns for that period have been as follows:— $\frac{1}{2}$ cwt. superphosphate, 15bush. 51bs. per acre; 1cwt. superphosphate, 18bush. 13lbs. per acre; 2cwt. superphosphate, 22bush. 6lbs. per acre; 3cwt. superphosphate, 24bush. 16lbs. per acre. The check plot, which received no manure, yielded at the rate of 11bush. 22lbs. per acre. The net monetary return for the manurial

dressing in the case of each plot, after allowing for the cost of manure at 5s. per cwt., and valuing the wheat at 3s. 3d. per bushel, is as follows: $\frac{1}{2}$ cwt. superphosphate, 12s. 1d.; 1cwt. superphosphate, 17s. 3d.; 2cwt. superphosphate, £1 4s. 11d.; 3cwt. superphosphate, £1 3s. 3d. Since the tests were first undertaken the plot which has received no manure, has been badly affected with "take-all" each year; the plot which received $\frac{1}{2}$ cwt. of superphosphate has been less badly affected; the plot dressed with 1cwt. of superphosphate showed small affected patches, whereas the plots receiving heavier dressings have invariably been quite free from the disease. The Department of Agriculture is inclined to the opinion that the absence of "take-all" in the more heavily manured plots is attributable to the more rapid growth of the wheat plants in its earlier stages. It is just at this time that the disease is active, and the extra stimulation resulting from the supply of larger quantities of phosphoric acid enables the wheat to outgrow the disease.

Imported Bacon.

The sides of Irish, Danish, and Canadian bacon that were imported by the South Australian Government, displayed at the Royal Agricultural Society's Show in Adelaide, and subsequently, at the request of the Victorian Department of Agriculture, exhibited at the Royal Agricultural Society's Show in Melbourne, afforded excellent opportunities for comparing the type of bacon that is meeting the biggest demand in the United Kingdom with the locally grown and manufactured product. In the opinion of the Dairy Branch of the Department of Agriculture, the outstanding feature of the imported sides was that they were longer, wider, and deeper than the local product. Comparison of the imported sides with bacon in the "export class" at the Adelaide Royal Show revealed that the latter did not come within 11in. of the length of the former, and further, the sides did not carry the weight. It is estimated that the live weight of the pigs, from which the imported sides were made, approximated 208lbs. in the case of the Irish, 190lbs. in the case of the Danish, and 182lbs. in the case of the Canadian. From the point of view of flavor, the locally manufactured product apparently fell short. The imported bacon certainly carried considerably more fat on the sides than is usual with South Australian bacon. However, on cooking, this fat was found to remain firm with no tendency to stringiness, and the lean meat was found to maintain a softness which was very attractive to the palate.

Fertiliser Tests at Smoky Bay.

At the request of the local Branch of the Agricultural Bureau, the Department of Agriculture recently undertook to conduct experimental plots in conjunction with Mr. E. Lovelock, of Smoky Bay. Local land-holders have been inclined to the belief that wheat crops in this district did not respond adequately to dressings of superphosphate. A chemical analysis of the soil supports this belief. This analysis shows the presence of 0.085 per cent. of phosphoric acid, a percentage largely in

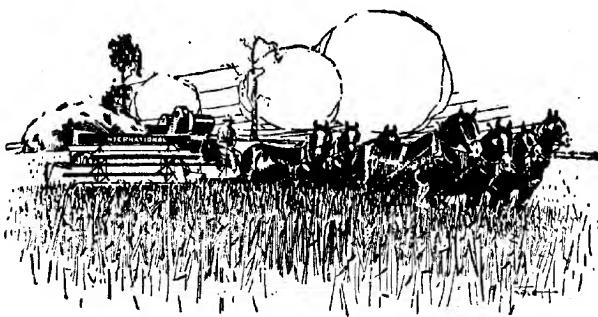
excess of the content of most South Australian soils, and very close to the standard laid down for normal crop growing requirements. It also reveals that the soils are lacking in potash, a circumstance not generally met with in agricultural soils in South Australia. A further peculiarity is that the soils under consideration are mainly composed of calcareous sands, in contradistinction to the general bulk of sandy soils of the State, which are largely siliceous in nature. Accordingly, a series of seven plots has been laid out, and in these wheat is being tested with varying quantities of superphosphates, muriate of potash, and superphosphate and muriate of potash in conjunction.

Imported Sorghums.

The installation of a pumping plant and other facilities has enabled the Department of Agriculture to grow crops under irrigation at the Government Experimental Farm at Kybybolite. Amongst crops that are being subjected to test are some of the important types of sorghum and allied plants, which are being so extensively grown in America. Five varieties of Sorgo (the name given in America to types of sorghum grown for forage only), four varieties of Kafir (the type of sorghum grown both for forage and for grain), and two sorghums (the type grown for grain only), have been secured from the United States Department of Agriculture and are now being sown. The sorghums (grain producers) have become a very important crop in a number of countries during recent years, and there is reason to believe that they will occupy, in the future, a more important position in South Australian agriculture than has hitherto been the case.

Vine Diseases.

The changeable character of the spring weather up till the present indicates the possibility of a recurrence of the downy mildew disease of the grape vine, as well as an outbreak of the black spot fungus. For the former disease, the application of Bordeaux mixture, when the young shoots of the vines are about 15in. to 18in. long, is the recognised treatment in countries in which the disease has been prevalent for some time. The mixture recommended consists of 6lbs. to 10lbs. of copper sulphate, 4lbs. of freshly slaked lime, and 50galls. of water. As a means of spreading the mixture and increasing its efficiency, casein can be used at the rate of 1oz. to 10galls. of the solution. Burgundy mixture is sometimes used instead of Bordeaux; the strength of the mixture recommended in Victoria is 7lbs. of copper sulphate, 11lbs. of washing soda, and 50galls. of water. The Horticultural Branch of the Department of Agriculture mentions that the outstanding feature connected with the treatment of these diseases is that the protective layer of the mixture should be placed over the foliage before the diseases make their presence known, and not after the injuries become apparent to the naked eye.



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Thinning Fruits.

The Horticultural Branch of the Agricultural Department continues to receive reports to the effect that in some localities stone fruits have set very thickly. Usually, a natural casting takes place and the trained horticulturist can determine approximately by the color of the fruit the extent to which this casting will thin the crop. Should it be found, subsequently, that the tree is carrying a larger number of fruits than it is likely to mature to the best advantage, the grower will do well to thin them out by hand. This is generally done at about the time the stone is beginning to firm. It is somewhat difficult to indicate exactly the space that should be left between the fruits. In the case of the peach, varieties differ in their capacity to develop fruits. Most kinds, however, should have the individual fruits spaced about 4 in. apart. On the other hand, some kinds, such as the Elberta, will mature good fruit even if it is spaced at lesser intervals. Apricots may be left almost touching one another. A tree making vigorous growth will develop a larger quantity of good fruit than a tree scanty in foliage and stunted in development. This principle applies also to individual branches of a tree.

Codlin Moth Control.

In most fruit-growing districts the apples and pears are rapidly passing from the blossoming to the fruit-setting stage. Consequently, the Horticultural Branch of the Department of Agriculture recommends growers to lose no time in giving the trees the first spraying with arsenate of lead to check the brood of codlin moth caterpillars, which emerges from the eggs of the over-wintered insects. This first spraying is of particular importance to those varieties of apples and pears, which naturally close in their calyces within a week or so of the dropping of the blossoms. At this time of the year the young fruits swell very rapidly. It becomes necessary, therefore, to follow the first spraying with a second application. It should be borne in mind that all the over-wintered codlin insects do not hatch out into moths at one time. The hatching is spread over a period of from four to six weeks, hence it is desirable to keep a coating of the poison over the surface of the growing fruits as a protection against the attack of the insects.

MALLEE LANDS INSTRUCTOR.

The services of the Mallee Lands Instructor (Mr. C. P. Hodge) are available to Branches of the Agricultural Bureau and others in the Mallee lands districts. Approximately one-half of this officer's time will in the future be spent on Eyre Peninsula, the other half being devoted to the mallee areas of the mainland. Branches of the Agricultural Bureau desiring to arrange for visits by Mr. Hodge should communicate with the Secretary, Advisory Board of Agriculture.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"W. F. F.," Narridy, has four-year-old gelding with a film over one eye.

Reply—I advise you to obtain the following lotion:—Sulphate of zinc, 6grs.; tincture of opium, $\frac{1}{2}$ dr.; distilled water, 2ozs.; mix. Apply a few drops twice daily with an eye dropper.

Secretary, Agricultural Bureau, Carrow, reports cow with a swelling of the left knee; at times the cow stands with the affected limb raised off the ground.

Reply—It is impossible to state definitely the nature of the injury, but from the degree of lameness and pain it is not unlikely that she had fractured one of the small bones of the knee. I advise you not to apply liniments or blisters, but place her in a small paddock and see that she is well provided with feed and water so that she can rest it as much as possible. I think she will take some time to recover, and may have some permanent stiffness of the joint. The complaint will not affect the milk except in quantity.

Secretary, Agricultural Bureau, Tarcowie, reports horses which become stiff and lame after being pastured on wheat, clover, wild oats, &c.

Reply—The complaint is undoubtedly a mild subacute form of laminitis (founder). I think you will find that they will recover in a few days if removed from the pasture. Give them mash diet and cooling medicine—Epsom salt 1oz., saltpetre 1 teaspoonful, in mash or drinking water for a few days.

"L. A.," Port Lincoln, has aged draught horse in good condition, at intervals lies down and rolls.

Reply—The horse suffers from slight attacks of colic. He requires careful feeding. Put him on a ration and water him before feeding. Have his mouth inspected, and if necessary have his teeth attended to. See that he does not become constipated, and keep his bowels regular by suitable diet. Even though the attack may quickly pass off and appetite return, it would be wise to cut down the next feed by half, or substitute a little bran mash. If the pain continues give a pint of raw linseed oil and an ounce and a half of turpentine as a drench and give him enemas of warm soapy water.

"A. A. K.," Wudinna, reports horses rubbing and biting themselves. Pimples develop under the skin, and finally break out into sores. The trouble chiefly affects the legs.

Reply—This is caused by a minute animal parasite, and I advise you to treat by first washing legs thoroughly with kerosine emulsion, made by dissolving 1lb. of soap in a gallon of boiling water and adding one pint of kerosine. The next day apply a little sulphur ointment (one part of sulphur to four of lard). Mix these thoroughly, and apply to the part with plenty of rubbing. Repeat this treatment three times at intervals of one week.

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"A. C. W.," Paruna, has cow due to calve at the end of the month, with hard swelling under jaws.

Reply—The present swelling is probably the result of the former grass seed trouble. If she develops an abscess you should make a good incision into it so as to drain the cavity effectually and cleanse daily with a little disinfectant solution.

"B. C. D'A.," Ponde, has cow in good condition, milking well, and with a good appetite, which quids her food.

Reply—"Dropping of the cud" may be due to diseased teeth or to some condition which makes chewing painful. It may also be due to unwholesome or fermenting food material in the paunch, which when brought up for remastication is rejected by the animal on account of its unpleasant taste. As the food supply appears satisfactory, I would advise a thorough examination of the teeth, tongue, and interior of mouth. Any abnormal condition in this region must be attended to. If you cannot locate any trouble here give her the following powders:—Powdered carbonate of ammonia, 3oz.; powdered nux vomica, $\frac{1}{2}$ oz.; mix. Divide into 12 powders. Give one twice daily in a pint of cold water with half a cupful of treacle.

"L. G. R.," Sandilands, reports stallion which is slow in serving his mares.

Reply—As his health and condition, method of feeding, exercise, number of mares, &c., do not account for his peculiarity, it must be regarded as constitutional. You may get satisfactory results from a preparation known as Devatol A, which may be obtained from Messrs. A. M. Bickford & Sons, Currie Street. A tube of this costs about £1.

"W. S.," Wirrabara, reports three-year-old with a splint just below the knee.

Reply—This form of splint sometimes causes chronic lameness. It would be advisable to put her out of work if she is lame. Do not attempt to "remove" it until all heat and pain has disappeared. You can then apply the following blister:—Red iodide of mercury, 1dr.; lard, $\frac{1}{2}$ oz.; mix. Clip the hair off. Rub in for five minutes. Tie her head up short for an hour of two after blistering, so that she cannot reach it with her mouth.

"W. S.," Wandilla, has cow with diarrhoea.

Reply—This is only a symptom of some irritation of the digestive organs. Diet her carefully. Give her 1oz. of chlorodyne in half a pint of warm water twice daily for two or three days.

"T. Bros.," Taplan, has horse founder through eating wheat seven weeks ago.

Reply—Laminitis, founder, or inflammation of the feet is a more or less chronic condition depending upon the severity of the case and subsequent changes in the feet. The best treatment is the foot bath, i.e., stand him in cold water up to his fetlocks several hours daily. If you are unable to improvise a foot bath use wet packs on his feet. Give him plenty of soft laxative food.

"S. & Sons.," Ceduna, reports litter of pigs with "St. Vitus dance."

Reply—This is a nervous disease of young pigs, and is usually regarded as being due to hereditary influence. Provide a quiet, dry, and warm sty. Feed the sow on sloppy milk diet, and give her a teaspoonful of Fowler's solution of arsenic twice daily in her feed for a fortnight.

Hon. Secretary Agricultural Bureau, Elbow Hill, asks whether it is advisable to put mare to horse if the mare has not cleaned too well.

Reply—You can safely put her to use on the ninth day if she has quite recovered from the indisposition following foaling, otherwise it is useless to do so. If there is any discharge from the passage continue the douching with warm water and "Condyl's" daily. If she is stiff, it is probably a form of founder, which frequently occurs as a sequel to retained afterbirth. In this case she will require light diet, cooling medicine, and the application of cold wet swabs to the feet.

"L. H. M.," Meningie, has forwarded four worms taken from a sheep's head.

Reply—These are sheep "bots," and reach the situation in which you found them in the following manner:—The adult fly lays her eggs about the nostrils of sheep in the late spring or early summer months. The young bots crawl up the

nostril and fix themselves in the hollow cavities of the skull, where they remain for about 10 months. After this they become detached and find their way out, many, being expelled by the process of sneezing, shelter themselves in the ground under litter, &c., and turn into the pupa stage. A few weeks later the pupa gives rise to the fly, which breeds, the female depositing her eggs on the nostrils of sheep, and the same cycle is repeated. There is no practicable method of dealing with this parasite, which is now widely distributed in the State.

"J. N. R." Oakbank, reports on cow with a swelling from the jaw to the ear, which came up in a few days.

Reply—This swelling will be due to the formation of an abscess probably from the penetration of grass seeds. Apply a little blister to the swelling or immerse it several times with hot water. This will hasten the development of the abscess. As soon as you detect the presence of pus from the fluctuation of the swelling you can open it with a clean sharp knife. Make your opening in such a position as to drain the abscess cavity effectively. Keep the wound clean by washing with disinfectant solution. Keep her by herself until the discharge has ceased.

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GENERAL AGRICULTURE.

During the month the Director of Agriculture (Professor A. J. Perkins) attended conferences of the Agricultural Bureau held at the Veitch and Minnipa Experimental Farms. On the 31st the Director attended "Farmers' Day" at the Booborowie Experimental Farm.

The Instructor for Mallee Lands (Mr. C. P. Hodge) visited and addressed the following Branches of the Agricultural Bureau:—Nunkeri, Coonalpyn, and Petina. This officer also attended the Murray Lands Conference.

HORTICULTURE.

During the month the Horticultural Instructor (Mr. Geo. Quinn) gave a demonstration at the Hackney orchard to the students of the Fruit Culture Class of the School of Mines. On October 2nd, Mr. Quinn delivered a lecture, "Sprays and Spraying" to the members of the Clare Agricultural Bureau. Two visits were made during the month to Islington, to watch the results of spray experiments against lucerne flea. This officer also attended the Hills District Conference at Cherry Gardens and the Conference of Eyre Peninsula Branches at Minnipa.

Mr. C. H. Beaumont (Orchard Instructor and Inspector) addressed the Ashourne and Meadows Branches on matters dealing with "spraying," and attended the Strathalbyn show.

POULTRY.

The Poultry Expert (Mr. D. F. Laurie) visited the Winke, Lone Gum, and Monash Agricultural Bureaux and delivered addresses on matters relating to the poultry industry. Mr. Laurie also attended the homestead meeting of the Kangarilla Bureau on Saturday, October 7, and delivered a short address.

DAIRYING.

The Assistant Dairy Expert (Mr. H. J. Apps) delivered addresses to the members of the Paruna and Mount Remarkable Branches of the Bureau. Mr. Apps also visited factories and dairymen in the following districts:—Murray Bridge, Yankalilla, and Millicent.

GENERAL.

The Secretary, Advisory Board (Mr. H. J. Finnis), attended Conferences of the Agricultural Bureau held at Veitch, Cherry Gardens, and Minnipa, and addressed a meeting of the Clarendon Branch.

COTTON TRIALS AT THE IRRIGATION EXPERIMENT ORCHARD, BERRI, SEASON 1921-22.

[A report prepared by the Horticultural Instructor, MR. GEO. QUINN.]

I desire to present the final results of the trials conducted at the Berri Experimental Orchard with seven (7) varieties of cotton during the season 1921-22.

The varieties consisted of Pima (18lbs. of the seed of which was presented by the Australian Cotton Growers' Association), Sakellarides, Brown No. 4, Hartsville No. 12, Webber 49, Allen's Improved Long Staple, and Sunbeam Long Staple. Sixty (60) pounds of seeds of the last-named six sorts were presented by the British Cotton Growers' Association through the Commonwealth Government.

The trials were carried out in plots numbered 1 to 4, the first three of which were sown with the Pima variety.

Plot No. 1, which covered .0473 of an acre in area, consisted of a very deep sandy loam, which had previously been used for some years as a horse paddock and for raising green feed. During the time it was occupied for those purposes it received dressings of artificial fertilisers as well as the stable manure dropped in abundance by the animals. It may, therefore, be assumed to possess a fertility in excess of the average Murray irrigation land, and the failure of superphosphates to bestow any benefit on the yield harvested from a certain portion of it is probably explained in this way.

Plot No. 2, which comprised an area of .309 of an acre of very coarse and leachy sandy loam, is planted with one year old fig trees, three rows of cotton being sown between every two rows of these small trees. This soil has had several moderate dressings of stable manure, and green leguminous crops were ploughed into it during the seasons 1918-21. It could not be deemed to be either rich in fertility or possessed of an average moisture holding capacity.

Plot No. 3 covered an area of .376 of an acre of light, puffy, sandy loam characteristic of the land occupied by mallee along the river districts. This plot had been sown to an oaten hay crop in May, 1921, and this was cut away towards the end of October—a week or two prior to sowing it to cotton. This land could not be considered to be more than a second grade soil in so far as fertility is concerned, whilst its fine particles renders it liable to drift when exposed to wind storms.

Plot No. 4. comprised many rows of six varieties sown between young fruit trees and grape vines over an area of approximately three acres of heavy type of blue bush soil found on river flats, which have been formed by the sediments left by inundations when the river was in flood, probably ages ago. This soil is made up of extremely fine particles cemented together to such a degree as to render it extremely impervious to the penetration of water. Until broken and aerated deeply, and rendered friable through the addition of lime compounds.

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this soil turns up stiff and lumpy. Prior to being set with trees and vines, this plot had been broken and subsoiled and dressed with gypsum a year or more ago, but the effects of this treatment have not yet been fully realised.

The following is drafted from a detailed account of the treatment and yield of each plot as kept with commendable care by the Manager (Mr. Savage), and supplied for the purposes of this report.

PLOT NO. 1.—VARIETY, PIMA.

The land was ploughed 6in. deep and cross harrowed. On October 28th and 29th it was well irrigated in furrows made 2ft. apart, and on October 31st harrowed a third time, when rows were set out 3ft. 8in. apart by the use of a line and hand hoe. A light watering was sent down these drills, and four seeds dropped together into the wet furrows at intervals of 1ft. (This represented approximately 18lbs. of seed to the acre).

The soil temperature at the surface ranged between 70deg. and 73deg. Fahr., and the air temperature between 82deg. and 105deg. Fahr. at this time, and the seedlings appeared in four to five days after sowing.

On November 8th the spaces between the rows were broken with a one-horse scarifier, and on November 17th and 18th the land was again irrigated. The rows were hand hoed on November 21st and 22nd, and scarified a second and third time on November 22nd and December 8th respectively. Three further irrigations, viz., on January 4th, February 1st, and March 25th and 26th were applied. On January 6th and February 3rd the plot received its fourth and fifth scarifyings. On January 9th the second hand hoeing was given. Thinning the plants in the first 23 rows to intervals of 1ft. apart took place on December 1st and 2nd, 1921. On February 3rd—two months later—the plants in rows 21 to 23 were thinned to intervals of 2ft. apart. Rows 24 to 30 were not thinned.

Rows 1 to 11 were dressed with mineral superphosphate at the rate of 1cwt. per acre at the sowing time, but no other row received any fertiliser during the trial. Owing to their proximity to the orchard boundary, rows 1 and 3 came under the influence of some peach trees and in consequence were excluded. Although situated in a more than usually protected position, a few plants in the plot were damaged by sand storms on November 26th. The plants in this plot grew strongly reaching a height of 5ft. The first flowers were noticed on January 10th (71 days after sowing), and the first bolls were opening in early April (about 156 days after sowing).

Between April 25th and May 4th 3*1*/₂in. of rain fell, causing the seeds to germinate and the cotton to turn mouldy in the opening pods. The effect of this rain seemed to cause the bolls to open slowly and imperfectly, thus increasing the cost of picking the cotton quickly and cleanly from the capsules. The first cotton was gathered on May 17th, and harvesting finalised on August 25th, or over a period of 14*1*/₂ weeks. Owing to the late maturing of these plants many bolls did not develop fully, and the possible yield was much diminished in

consequence. The seed cotton harvested weighed 347½ lbs., or at the rate of 853 lbs. per acre.

The cultural treatments applied to this plot may be summarised as follows:—One ploughing, three harrowings, five scarifyings, six irrigations (one light), two hand hoeings.

TABLE I.—*Showing the Returns from the Various Experiments with Pima Cotton, Plot 1.*

Rows.	Test.	Area of Plot.	Weight of Seed	
			Acre.	per plot. per acre.
1.3 (3 rows)	Barrier rows, plants thinned to 1ft. apart	.043	17.5	362.32
4-11 (8 rows)	1cwt. superphosphate per acre, plants thinned to 1ft. apart . . . . .	.1288	120.5	935.56
12 (1 row)	Barrier row, plants thinned to 1ft. apart	.0161	14.5	900.62
13-20 (8 rows)	No fertiliser, plants thinned to 1ft. apart . . . . .	.1288	122.5	951.09
21-23 (3 rows)	No fertiliser, plants thinned to 2ft. apart . . . . .	.0483	33.0	683.23
24-30 (7 rows)	No fertiliser, plants not thinned . . . . .	.037	39.5	1067.57
1.30		Total Plot . . . . .	.4073	347.5 853.18

TABLE II.—*Showing the Cost of Producing the Cotton from Plot 1. Area of Plot, .4073 acre.*

Work.	Hours.	Rate per Hour.	Per Plot.		Acre Costs.
			£	s. d.	
Ploughing	3	2/2½	0	6 6½	0 16 3
Harrowing	1	2/2½	0	2 2½	0 5 5
Hand planting seed	34	1/6½	2	13 1	6 10 4
Irrigating	13½	1/6½	1	1 1	2 11 9
Cultivating	6	1/10½	0	11 3	1 7 7
Hoeing	16½	1/6½	1	6 0	3 3 10
Thinning	8½	1/6½	0	13 6	1 13 2
Picking	112½	1/6½	8	16 0	21 12 1
			£15	9 8	£38 0 5

NOTE.—Man's wages calculated at 12s. 6d. per day. Cost of horse hire (including harness and implement), at 2s. 6d. per day.

In connection with the above, the costs of both planting and picking are excessive. The former by the use of a properly fitted drill could be reduced probably to 30s. per acre. The harvesting could also be reduced vastly when the bolls have burst in a normal fashion. (The picking of this plot works out at 6.07d. per lb.) The probable cause of the absence of increased returns from the fertilised rows is referred to earlier.

The rows in which the plants were not thinned showed the highest yield, and the rows with plants left at intervals of 1ft. apart produced more cotton than those in which the plants were spaced 2ft. apart, and had grown much larger or spreading individually. These results, I understand, coincide with the findings of the cotton investigations recently conducted over a wide range of tests in Egypt.

PLOT No. 2.—VARIETY, PIMA.

As previously stated, this coarse, porous ground is planted to fig trees set in rows 22ft. apart. It had been ploughed during the winter, and just prior to seeding it with cotton the soil was first disc harrowed, followed by a spike harrowing.

Three furrows, each 3ft. apart, were taken out with a scarifier along the centre between each two rows of fig trees, and irrigation water was run down on them on November 2nd and 3rd, prior to sowing the seed in the wet soil by means of a single hoe maize drill. The patchy germination, which took place in six or seven days, was most probably due to the lack of moisture holding capacity of this soil. The plot was again irrigated along the planted rows on November 18th, and scarified again on December 8th. Further irrigations followed on January 4th, February 1st, and March 26th, making a total of five—one prior to seeding and four after germination and whilst growth was in progress.

The plot was cultivated with a single horse cultivator three times and hand hoed once. The harvesting began on May 18th and continued at intervals until July 31st, when 711lbs. of seed cotton had been gathered from a very patchy growth over the area of .309 of an acre. This merely worked out at 229.7lbs. of seed cotton per acre.

TABLE III.—*Showing the Cost of Pima Cotton, Plot 2. Area, .309 acre.*

Work.	Hours.	Per Plot.		Acre Costs.
		Rate per Hour.	Cost.	
Harrowing prior to planting ..	3	2/2 $\frac{1}{4}$	0 6 6 $\frac{1}{2}$	1 1 3
Planting with maize drill... ..	4	1/10 $\frac{1}{2}$	0 7 6	1 0 3
Covering seed where exposed ..	4	1/6 $\frac{1}{4}$	0 6 3	1 0 3
Irrigating	8 $\frac{1}{2}$	1/6 $\frac{1}{4}$	0 13 3 $\frac{1}{2}$	2 3 1
Hoeing	10	1/6 $\frac{1}{4}$	0 15 7 $\frac{1}{2}$	2 7 10
Scarifying	11	1/10 $\frac{1}{2}$	1 0 7 $\frac{1}{2}$	3 6 11
Picking *	19	1/6 $\frac{1}{4}$	1. 9 8 $\frac{1}{2}$	4 16 1
			£4 19 6 $\frac{1}{2}$	£15 19 8

* Equalling 5.02d. per lb.

PLOT No. 3.—VARIETY, PIMA.

This land is portion of an unplanted block which grew an oaten hay crop during the winter and spring from May to the end of October. On November 16th the stubble was ploughed 6in. in depth, but the irrigation water being at hand on the commanding channel, no time could be given to further preparation of the soil.

Furrows were ploughed out at intervals of 4ft. on November 17th and the land irrigated immediately. The seed was sown next day with the maize drill, and where the drill did not bury it hand rakes were used to cover the seeds. Germination was good, six days later. After the seedlings appeared three irrigations were applied, viz., on January 1st, February 5th, and March 27th. The land was scarified three times with the single horse scarifier. The growth of the plants on this plot was only fair, and the yield consequently very light.

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Harvesting commenced on May 18th, and was finalised on August 4th. From an area of .376 acre, only 48½ lbs. of seed cotton was collected—equivalent to 129lbs. per acre.

TABLE IV.—*Showing the Cost of Pima Cotton, Plot 3. Area, .376 acre.*

Work.	Hours.	Per Plot.	Cost.	Acre
		Rate per		Cost.
		Hour.	£ s. d.	£ s. d.
Ploughing and furrowing out...	3	2/2½	0 6 6½	0 17 5
Planting with maize drill ...	3½	1/10½	0 6 6½	0 17 5
Covering seed after drill ...	2½	1/6½	0 3 11	0 10 5
Cultivating	6	1/10½	0 11 3	1 10 6
Hand hoeing	4	1/6½	0 6 3	0 16 8
Irrigating	8	1/6½	0 12 6	1 13 3
Picking	*9	1/6½	0 14 0½	1 17 4
			£3 1 1½	£8 2 6

* Equalling 3.47d. per lb.

PILOT 4.—SIX VARIETIES. (Area, 1.688 of an acre actually sown).

As previously stated, the soil in this plot is a full-bodied, heavy loam, naturally of a very intractable character; when first broken being cloddy and resistant to the absorption of water, but fairly retentive of moisture when once wetted. The cotton was sown in the spaces between the rows of young—some three years old—fruit trees and grape vines. The trees are planted in rows 24ft. apart, and five rows of cotton at intervals of 3ft. were sown down the central strip. The rows of vines are 12ft. apart, and three rows of cotton were drilled in each central plot. The land had been ploughed during early spring, dis harrowed twice, and once stirred with a cultivator having fixed tines.

Between November 14th and 17th the seed furrows were opened and the seed sown thinly by hand into the wet soil and covered by means of hand rakes. The seedlings appeared in from four to six days. This plot was irrigated three times after sowing, and the after tillage consisted of four scarifyings and one hand hoeing. The plants were thinned out to spaces of 1ft. in the rows. The harvesting lasted between May 29th and August 2nd—only small quantities of seed cotton being gathered.

The following observations are recorded by Mr. Savage:—

Sakelarides.—This Egyptian variety made the best growth and yielded better than the others, but as it was growing near a “fill,” where a channel burst occurred at the last irrigation, causing the ground to be heavily flooded, these facts may need modification. The ripening of the bolls was considerably delayed on account of this occurrence. The bolls are mostly three locked (three celled), but some fours are noticed: 38lbs. seed cotton picked.

Brown No. 4.—These plants grew only fairly well, the yield in consequence being light. The bolls are usually four, but sometimes five celled bolls are noticed; yield, 20½lbs. seed cotton.

Harlsville No. 12.—This variety started well, but did not continue to grow strongly. The plants were shorter than those of the other varieties on the same soil and in receipt of the same treatment. The bolls were four and five locked, about half of each type. The crop of seed cotton was the smallest of any variety under trial; 9lbs. seed cotton gathered.

Webber 49.—The plants of this sort grew well, but were disappointing in their yield. The bolls were mostly four celled; 19½ lbs. seed cotton harvested.

Allan's Improved Long Staple.—These plants grew well, comparing favorably with Sakelarides. The bolls appear to be mostly four locked; 24lbs. seed cotton harvested.

Sunbeam Long Staple.—These plants grew in a rather dwarfed condition. The bolls appeared to be partly four and partly five celled; 13lbs. seed cotton harvested.

In connection with this variety plot, it must be admitted that the seed was received and sown very late. The soil was of such a character that fine tilth or pulverisation seemed impracticable, hence it cannot be claimed they had a fair opportunity of displaying their best qualities of growth or yield. It is unfortunate that, owing to no land being otherwise available, I was compelled to have these sorts sown in close proximity to each other, as the resulting seed is almost certain to be affected by cross pollination having taken place between the varieties.

It is proposed, however, to grow some seeds of each in the coming season to note if such has occurred. At any rate we have been enabled to see that three to four rows sown between newly planted trees is the utmost that a 24ft. strip can be expected to carry, and, at the most, only two rows along the 12ft. spacing between the very young grape vines should be permissible. As the trees and vines enlarge the rows of cotton would of necessity be contracted to half these numbers.

GENERAL CONCLUSIONS.

1. That the cotton plant will thrive when grown under the climatic and soil conditions prevailing in the irrigated areas of the Murray Valley, and produce a lint of exceedingly high quality, has been proved.
2. That any variety of cotton to be suitable for growing commercially in conjunction with irrigated fruit and vine culture in those areas must be sufficiently matured to permit the opening of the harvesting season taking place from the middle to end of March, and reaching completion in May. This would cover the period from the finishing of the Gordo harvesting until the beginning of the ploughing and pruning operations, as well as harvesting the citrus crop.
3. The Pima variety, if sown at the end of September and early October, gives promise of coming within this range.

4. That sowing at this period could be safely followed is borne out by the records of soil and air temperatures kept at the Experimental Orchard, whereby we learn that at the end of September and beginning of October the ground surface temperatures range from 58deg. to 62deg. Fahr., whilst the latest frost recorded during the past four years occurred on October 5th, 1918, when the temperature just dropped to freezing point. The lowest temperatures recorded in October during the same period was on October 3rd, 1918, and on the same date 1920, when the mercury showed 29deg. Fahr. As at the above soil temperatures, viz., 58deg. and 62deg., these seedlings would not appear through the soil in such short periods as those quoted herein, the danger to them from frostbite would seem remote. Upon this phase of the subject the following table may prove informative:-

TABLE V.—*Showing the Rainfall, Mean Average Shade, Ground, Sun, and Soil Temperatures from October 1st, 1921, to August 31st, 1922.*

Month.	Rainfall. Inches.	Shade Temp.			Ground Surface.			Soil 18in. from Surface.		
		Min. Deg.	Max. Deg.	Min. Deg.	Max. Deg.	Min. Deg.	Max. Deg.	Min. Deg.	Max. Deg.	Max. Deg.
1921.										
October . . . . .	.38	48	78	45	—	—	62	64		
November . . . . .	.69	56	86	54	—	—	70	71		
December . . . . .	.20	58	84	55	145	—	73	75		
1922.										
January . . . . .	.41	56	89	53	146	—	74	76		
February . . . . .	.28	59	93	56	144.5	—	76	78		
March	—	51	86	48	137.5	—	72	74		
April	1.15	51	78	47	127.5	—	65	66		
May	2.60	46	69	40	118	—	58	59		
June . . . . .	.81	41	59	37	104.5	—	53	54		
July . . . . .	.96	39	59	35	100	—	50	51		
August . . . . .	.50	41	63	35	110	—	52	53		

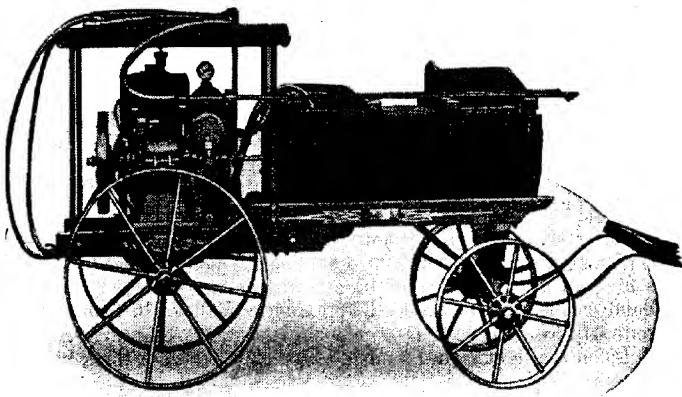
5. From experience gained during the season under review, it is certainly desirable to sow cotton—like all summer growing crops—immediately after irrigating in sandy soils, in the wet soil, and in heavier land as soon as it will not puddle under the action of the drill or hand rakes.

6. It would seem that the advice given in the United States of America not to irrigate often during the early stages of the plant's growth, to increase the irrigations after the flowers begin to open freely, and to cease irrigating early enough to cause the plants to ripen off before the cold weather kills the upper portions of them would, if intelligently applied, enable the cotton harvest to be completed in the Murray Valley without much loss through undeveloped bolls or owing to bolls being seriously damaged by winter rains or frosts.

7. *Pests.*—No exotic pest was detected amongst these plants, all of which were grown from imported seeds. In the early summer, however, a small caterpillar, the larva of an indigenous moth—identified by Mr. A. M. Lea, F.E.S., as *Earias Muegeli* was found entering the

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branches at the axils of the leaves, and later on tunnelling into the bolls. This pest is recorded from North Australia, New South Wales, Queensland, Marquesas, Marshall, Fiji, and Tahita Islands in the Pacific, and though found over a wide area its depredations could not be considered as very alarming.

8. *Weight of Lint per lb. of Seed Cotton.*—Tests made by taking a number of samples of bolls on different occasions showed 5.7 per cent. of fibre and 10.3 per cent. of seed by weight. I understand the general calculations adopted in cotton growing countries state the proportions to be approximately one-third part by weight of lint to two-thirds by weight of seed cotton.

COTTON GROWING COMPARED AS A COMMERCIAL PROPOSITION WITH FRUITGROWING OR AS A POSSIBLE ADJUNCT THERETO.

If one may review this aspect of the subject from the basis of the preceding report, the only reliable data would appear to be contained in the statements relative to Plot 1, and even in the utilisation of these some reservations become necessary.

In the first place the soil in this plot stands higher in the scale of fertility than would the average sandy loam of which the larger proportion of our irrigable Murray lands is composed. Again, the plot enjoyed a sheltered position which is rare on the open areas until such times as fruit trees have grown large, or vine-clad trellises arisen as barriers to the devastating sand drift.

Taking these advantages into consideration I am disposed to the opinion that a yield of 850lbs. of seed cotton per acre would be quite as high an average as would be attained on the general type of soil found on the irrigated areas of the Murray Valley. In favored spots on the full bodied soils it is possible this might be nearly doubled whilst on the light mallee lands, particularly. I do not think it would be approached.

I am informed that in the irrigated cotton growing areas of California and Egypt much higher yields than 850lbs. of seed cotton per acre are obtained, but then it must be remembered the majority of these soils are infinitely richer and deeper than are our upper Murray lands which are under irrigation.

As previously remarked, the costs of production as recorded in connection with the trial plots grown at Berri are in some respects excessive. This is inseparable from a form of tillage into which much hand labor is introduced. Against this, however, it should be claimed that on a small plot mostly worked by hand the results from almost any crop are reflected in better growth and higher yields than is the case where the larger implements reduce tillage charges, but unfortunately with a corresponding decline of good husbandry.

Assuming that all round savings may be made in the costs of production when applied to broad-acres, and that the yield may still be maintained at 850lbs. of seed cotton per acre, I desire to submit the following estimate of the cost of production and the return per acre

which might be obtained at given prices for the seed cotton, that is to say, calculating:—

	Per Acre.
	£ s. d.
Seeding at	1 16 0
Irrigating at	2 5 0
Soil Tillage at	5 0 0
Thinning at	1 5 0
Harvesting at 3d. per lb.	10 12 6
Water rates and rent	3 5 0
Interest at 6 per cent. on cost of preparing land for irrigated crops	1 6 0
Unforeseen items, say	0 10 6
<hr/>	
The total cost of production would be . . .	26 0 0

Against this is set a yield of 850lbs. of seed cotton, which, if saleable at 9d. per lb., would give a gross return of £31 17s. 6d. per acre, or again, if sold at 8d. per lb. a return of £28 6s. 8d., showing assumed profits of £5 17s. 6d. and £2 6s. 8d. per acre respectively. If, however, the price fell to 7d. per lb., the anticipated loss would be £1 4s. 2d. per acre. It will be seen, therefore, that as a sole crop for planting on our expensive irrigable lands cotton does not at present, allowing costs for labor and material, and prices for seed cotton, offer much encouragement to the settler on the average sand ridge soil. Should, however, the blocker possess suitable soil, and succeed in increasing the yield to 1,200lbs. of seed cotton per acre, saleable at, say, 8d. per lb. his profits would approximate to those obtained in pre-war times for some of the principal lines of dried fruits.

Although I am not yet aware that Berseem or Egyptian Clover has been tried on the Upper Murray lands as a winter crop, which might be grown to augment the returns per acre receivable from cotton, it is evident some such auxiliary is desirable, not to say absolutely essential. Cereal hay does not mature sufficiently early to permit of its use on the land between the harvesting of one cotton crop and the return of seed time for the next crop.

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As a comparison the returns received from dried fruits grown under irrigation at Mildura during the eight years covered from 1907 to 1914, when prices were at a very low ebb, are quoted from figures compiled immediately subsequent to that period by Mr. J. J. Lever of the district.

Currants.—Average yield 1.28 tons per acre, sold at the average price of £34 9s. 7d. per ton, or equal to £38 12s. 4d. gross return per acre, or 3.69d. per lb. After deducting costs of production, drying, &c., equalling £14 14s. 4d., the net return to the grower was stated at £23 18s.

Sultanas.—Average yield .78 ton per acre. Average price £39 12s. 6d. per ton, equalling 4.24d. per lb., or a gross return of £31 6s. 1d. per acre. From this was deducted costs of production, &c., £12 14s. 9d. per acre, leaving a net return of £18 11s. 4d. per acre.

Lexias.—Average yield .75 ton per acre, with average price of £21 6s. 9d. per ton, or a return of £16 0s. 1d. per acre gross. The costs of production and drying totalled £12 10s., leaving only £3 10s. 1d. to the grower per acre. It may be mentioned that the export proportion of lexias dried at this period was 47.3 per cent. of the crop.

In his excellent manual, "Fruitgrowing under Irrigation," Mr. F. R. Arndt, formerly of Berri, gives with minute detail his returns as showing a profit to the grower of £13 10s. per acre on sultanas, £6 6s. per acre on stone fruits (peaches, apricots, and nectarines), and £1 11s. per acre on oranges.

It will thus be seen that should pre-war prices for dried fruits again prevail—even if the cost of labor and materials also recede—the cultivators of those of our irrigated fruit lands which have been prepared under the most costly regime on the one hand, or have been purchased at inflated values on the other, will need the assistance of some subsidiary crop to enable them to procure anything more than a living wage from their holdings.

At present, with no subsidiary winter growing crop in view to augment the return per acre, cotton growing in the Murray Valley would appear to offer to the new settler an opportunity of making wages, and remaining constantly on his holding to attend to his newly planted trees or vines as their immediate requirements demand. For a careful, industrious, intelligent man, who may secure some help from his family, I know of no crop which has yet been suggested which is so likely to meet this position.

I consider the evidence gained warrants the recommendation that cotton be planted between the rows of young fruit trees and grape vines, beginning the first year after planting the vines with, say, two rows set 3ft. apart down the centre when a 12ft. strip separates the rows of vines, or if a lesser width sow one row only. Sow the seeds in groups of two or three at intervals of a foot in the freshly watered drills. In the second season reduce the cotton planting to one row down the centre of the vine plots.

In the case of fruit trees when the rows are set 22ft. apart, not more should be planted than four rows of cotton in drills 2ft. 6in. apart, or three rows 3ft apart down the centre of the strip between each two rows of trees. This number of rows should be reduced as the fruit trees grow larger. How long the practice can be continued remains

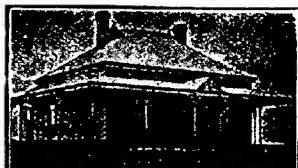
to be tested, but the behaviour of both cotton plants and the trees or vines will afford the best indication of when to cease the dual cropping. By utilising cotton in this manner the costs of tillage and irrigation can be divided between the fruit plants and the cotton crop, though more water will probably be required to sustain both than one only. It can be foreseen, however, that the shading of the soil by means of the foliage of the cotton plants during the hottest part of the summer will retard rapid evaporation, and prove highly beneficial to the young trees or vines as well as protect them in turn from the stinging injuries of flying grit on the sandy uplands.

In conclusion, it may be remarked that the experiences in attempting to grow cotton during the past season on private blocks in the surrounding areas indicate most emphatically that this plant needs intelligent and systematic treatment in planting, irrigating, tillage, and providing shelter from sand drift, and without the blockholder is prepared to give such attentions to the plants the results will approximate to those insignificant returns recorded for two or three of the plots referred to in this report.

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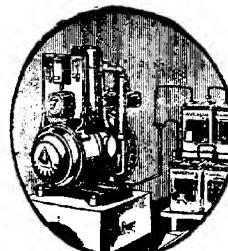
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ON THE CONTROL OF THE BROWN ROT DISEASE OF ORANGES.

[By GEOFFREY SAMUEL, B.Sc.]

The brown rot disease of oranges, which is new to South Australia, has been causing considerable losses in the southern districts this year. The wet flats of the Inman Valley, and places at Langhorne's Creek where the river overflows through the orangeries, are just the situations in which the disease would be expected to develop. Indeed, losses in these districts have been estimated in hundreds of bushels this season. The severe loss is largely due to the extra heavy rainfall which these localities have experienced during the year, but the epidemic which has resulted has probably also served to spread the disease in great abundance to many places where it did not exist before, and even with a more normal season next year it may again cause loss.

Such heavy losses as occurred this year can be avoided by practising the proper methods for the control of the disease. As is the case with every disease, these control methods involve a little extra work and expense. If carried out thoroughly, however, and at the proper time, they save an amount of crop far greater in value than the expense of control. But if they are neglected, the diseased fruit lying around spreads the disease more and more, increasing the losses all the time.

HOW TO RECOGNISE THE DISEASE.

In the orangery the disease is first noticed, as a rule, by the fact that many oranges are dropping to the ground. If these are examined they are found to have a dull brownish rotten patch on them, which gradually spreads until the whole orange is a rather shrunken brown object. The skin of the orange does not become very soft and easily broken as is the case with blue mould. Affected oranges acquire a peculiar sickly sweet odour. It is noticeable that the oranges close to the ground are much more liable to the disease than those higher up on the tree.

In storage, not only do oranges with even the smallest brown patches gradually become rotten all over, but the rot may spread from such oranges to all healthy ones touching them.

HOW TO CONTROL THE DISEASE.

IN THE ORCHARD.

Pick up and remove all oranges which have dropped to the ground. Burn them or bury them deep (preferably with lime) as far as possible from the orangery. Do not throw them in the river as the disease can live in water.

Prune the lower limbs of the trees so that no foliage or fruit touches the ground. This is contrary to the usual practice in South Australia.

but when the brown rot disease has got into an orangery it only increases the losses to have foliage and fruit touching the wet ground. The pruning need only be sufficiently high to make the next stage—cultivation under the trees—easier.

Cultivate the surface of the soil frequently in spring and summer, especially under the trees, so that the surface layers are dried as much as possible. During a hot Australian summer this may possibly kill the disease right out of the soil.



South Australian Oranges, Showing Dull Brownish Patches Spreading Over the Fruit.

If the trees are irrigated, do this by means of trenches, filling them up afterwards, so as to keep the surface of the soil dry. Do not flood the surface.

These methods of control are based upon the fact that the disease can only live in moist soil; if the soil is dry the disease dies out. If these methods are carried out thoroughly there should be no need to resort to the last more troublesome and expensive method—spraying with Bordeaux mixture.

IN THE STORING AND PACKING SHED.

Pick out all oranges which show the slightest sign of brown rot. If possible, discard them at the time of picking the fruit. Dipping clean oranges in bluestone is little, if any, use. But if the oranges have to be washed, for example, because of sooty mould, bluestone (1oz. in 60gals. water) should be added to the water.

To summarise, control consists in keeping the ground free from diseased fruit, and cultivating thoroughly during spring and summer, especially under the trees. Now is the time to begin in order to prevent loss next year.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.

During the month of September, 1922, 51bush. of apples, 9,662bush. of bananas, 5bush. of oranges, 197bush. of passion fruit, 926bush. of pineapples, 1 bush. of paw paws, 117 packages of carrots, 375 bags of onions, 15,311 bags of potatoes, 16 packages of swedes, 6 packages of turnips, 17 packages of bulbs, 33 packages of plants, 42 packages of seeds, 7 packages of trees, and 2,489 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 to 1910. Of these, 36 second-hand bags and 1bush. of paw paws (no fruit fly certificate) were destroyed, and 58 wine casks and 7 packages of trees were fumigated.

Under the Federal Commerce Act, 100 packages of fresh fruit, 4,264 packages of citrus fruit, 12,768 packages of dried fruit, 10 packages of honey, and 3 packages of plants were exported to oversea markets. These were consigned as follows:—To India and East—475 packages of dried fruit, 2 packages of plants, 100 packages of apples, 10 packages of honey. To New Zealand—1,857 packages of dried fruit, 4,264 packages of citrus fruit, and 1 package of plants. To London—10,336 packages of dried fruit. To Vancouver—100 packages of dried fruit.

Under the Federal Quarantine Act, 1,428 packages of seeds, &c., were examined and admitted from oversea sources.

Interstate Imports.—Examined at Mount Gambier, September, 1922.

	Packages.	Bushels.
Bananas	67	100
Pineapples	9	14
Apples	33	33
Potatoes	617	—
Onions	1	—
Turnips (Swede)	17	—
Trees	1	—

Of these, 1 package of trees was fumigated.

STOCKOWNERS' RESPONSIBILITIES UNDER THE STOCK DISEASES ACT OF 1888.

[An address delivered at the Winter School for Farmers at Roseworthy Agricultural College by T. H. WILLIAMS, Chief Inspector of Stock.]

The majority of stockowners have an idea that a Stock Diseases Act is on the Statute Book of the State, but few realise their responsibilities under it. The Stock Diseases Act of 1888 is probably one of the most drastic Acts dealing with contagious and infectious diseases ever placed on any Statute Book, and has proved of great value to this State in preventing the spread of many diseases among stock.

The following are the diseases which are covered by the Act and the regulations under it:—Glanders, farey, equine fever, rinder pest, pleuro-pneumonia, tuberculosis, anthrax, scab, sheep pox, foot and mouth disease, catarrh, swine fever, trichinosis, rabies, lice and tick on sheep, cancer, actinomycosis, tick, fever of cattle, contagious pneumonia of swine, lice and mange of swine, contagious abortion, epizootic lymphangitis, Dourine, surra, camel mange (*sarcopetes camelii*).

The following diseases have also been proclaimed in respect of poultry:—Poultry tick fever, vent gleet, roup, chicken cholera, gapes, tumours, tuberculosis dirmatomycosis, chicken pox.

Fortunately for the South Australian stockowners, many of the diseases referred to above do not occur among stock in this State; nevertheless there are quite enough of them to keep stockowners and officers of the Stock Department busy. We have had anthrax (general outbreaks), but the State has been free of this dreaded disease for 10 years.

Actinomycosis.—(Lumpy jaw), a common disease among cattle, occurring all over Australia.

Equine fever.—It is believed that the so-called "equine fever" was equine influenza and forage poisoning.

Pleuro-pneumonia.—Unfortunately for cattle owners, this disease has asserted itself in several localities. The origin of our outbreaks have been Queensland and the Northern Territory cattle. Where affected animals came in contact with animals bred in this State the latter quickly developed the disease, and many dairymen have lost heavily.

Tuberculosis.—It is quite within the mark to say that about 6 per cent. of the cattle of the State might prove tubercular if they were subjected to the tuberculin test. Like pleuro-pneumonia, tuberculosis is introduced among beef cattle imported from other States, and the

State's stock are quickly infected if contact is allowed. All stock owners, and particularly dairymen, should be on the alert to detect this disease, because it is liable to infect human beings where milk from diseased cows is used.

Swine Fever and Contagious Pneumonia of Swine.—There has been several outbreaks during the past 17 years. The disease was first introduced from Victoria in stud animals; the spread was rapid and within six months the disease became general. Many local outbreaks have occurred since, but have fortunately been nipped in time to prevent widespread loss.

Lice and Tick affecting Sheep.—These were proclaimed a "disease" of sheep in 1890 and efforts were made to enforce dipping. For some years fair progress was made, but later it was found that, through the carelessness of many, more drastic legislation was necessary, and the Act of 1915 was passed. This Act made it compulsory for sheepowners to dip their sheep in certain defined areas every season before January 31st. There is no doubt that this compulsion has increased the value of sheep and wool from £200,000 to £300,000 a year. It is known that some sheepowners try to shirk their responsibility to keep their sheep free of parasites by dipping, but they are heavy losers.

Lice and Mange on Swine.—Owing to the filthy state that thousands of pigs were in a few years ago, a proclamation was issued which placed the above on the catalogue of infectious diseases of swine. To-day it is a rare thing to see affected swine.

Infectious Abortion of Cows has also been proclaimed a disease.

Now comes the point where the responsibility of the owner comes in. If any of his stock show symptoms of sickness (disease) which is or may be any of those mentioned as common among stock in the State, it is his duty to at once report to the Stock Department, and should he fail to do so, he renders himself liable to a penalty of £20 for every day he neglects to do so. Where the services of an officer of the Stock Department are obtained no charge is made to the owner, except as provided by the Stock Diseases Act, which states that an owner must pay all quarantine expenses (if any) incurred in stamping out disease. Officers must be met by owners at the nearest railway or mail stations.

I regret to have to record the fact that many stockowners have failed to report when outbreaks of contagious and infectious diseases have occurred among their stock. Some have given all sorts of ineffectual cures on their own account, others have relied on the opinion of a "knowledgable neighbor," while many have employed quacks who told them pleuro-pneumonia and tuberculosis affecting their cows were merely slight colds and that a drench (supplied by the quacks) would soon cure the diseased animals. Now it must be clear to the mind of stockowners that, if there is disease among their animals, they have everything to gain by complying with the requirements of the Act. The Stock Department will give them reliable advice and attention.

A word with regard to the most dangerous class of man the public need to be on their guard against will not be out of place. This is the man who knowingly gets rid of animals that have been in contact with diseased stock, more particularly pleuro-pneumonia animals. This has occurred and many dairymen were the losers as the result. The careless man is also a source of danger to his own and his neighbor's stock. If you wish to keep your herds free of disease do not introduce animals from a doubtful source among them, and always be careful of that plausible fellow who is willing to sacrifice something to oblige you when selling you stock.

RIVER MURRAY HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JULY, 1922.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during July.	Per Cow during July.	Per Cow October to July.	Per Herd during July.	Per Cow during July.	Per Cow October to July.
A	13	11.42	8,625.5	663.50	5,853.12	449.49	34.58	273.14
C	30	24.71	26,208	873.60	7,141.61	1,028.77	34.29	291.17
E	17	15.38	9,220.5	542.38	5,406.73	466.64	27.45	243.52
G	50.35	38.35	33,987	675.01	8,092.34	1,340.23	26.82	312.48
I	13	8	6,370.5	490.04	6,206.91	285.38	21.95	266.19
J	16	12.52	6,080	380.0	5,305.22	290.74	18.17	247.95
K	14	10.26	7,653.5	546.68	5,860.46	342.73	24.48	261.60
L	15.58	13.03	9,171.5	588.67	5,002.51	433.55	27.83	241.34
M	17	14.55	8,289	369.94	4,845.90	325.73	19.16	218.67
O	38	26.68	17,458.5	459.43	4,837.27	848.59	22.33	227.89
R	22	16.90	10,157	461.68	3,741.99	474.18	21.55	187.62
S	12	8.03	6,939	578.25	4,825.78	318.01	26.50	213.77
T	14	12.06	5,855	418.21	4,769.75	292.15	20.87	238.66
U	12	12	8,447.5	703.96	6,704.73	388.94	32.41	305.02
V	15	14.65	5,777.5	385.17	4,762.39	307.81	20.52	219.55
avg.	19.93	15.90	11,216.0	562.81	5,807.70	506.20	25.40	255.20

ORCHARD NOTES FOR SOUTHERN DISTRICTS, NOVEMBER, 1922.

[By C. H. BEAUMONT, Orchard Instructor and Inspector.]

This month will show whether you are efficient in the use of the spray pump and whether the material you are using is doing good work. For checking codlin moth use arsenate of lead; for root borers use arsenate of lead; for red spider use lime sulphur wash; for woolly aphid, peach aphid, and orange aphid, use black leaf 40 and resin wash; for cut worms and leaf eating caterpillars and insects use arsenate of lead; for shot hole on apricots, cherries, and plums, especially Japanese, use Bordeaux or Burgundy mixture; for downy mildew and anthraenose use Bordeaux or Burgundy mixture; for oidium and for strawberry mildew use lime sulphur wash. Clean the spraying plant after use.

Brown rot of the orange and lemon must be watched; trees must be pruned so that no limbs or fruit rest on the ground or within a foot of it. Before irrigating, collect all diseased fruit and fallen foliage and burn. After irrigating, cultivate the soil well, especially under the trees, and keep the soil fine and loose all through the summer months. A heavy dressing of lime under the trees will be helpful. Watch these notes for later instructions.

Rub off all useless growths on trees, especially the young trees.

Keep soil well worked, and water any newly planted trees that may appear to need attention. Do not forget to loosen the soil after irrigating.

Cases and trays should be ready for use. Picking baskets need attention: a few fruits bruised by careless handling will lower the price of the whole consignment. See that sulphuring boxes are in good order.

The exact time for cineturing of currant vines is just as the caps fall from the blossoms.

Clean and paint ploughs and harrows; loosen all nuts and oil the threads.

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TEMPORARY PREMISES—

11. GRESHAM STREET - - - ADELAIDE.

IMPORTED BACON.

For the purpose of enabling pigraisers and others interested to acquaint themselves with the type of bacon which met with the greatest demand in the United Kingdom, specimens of Irish, Danish, and Canadian produce were purchased in London, shipped to Australia, and exhibited at the recent Royal Agricultural and Horticultural Society's Show in Adelaide. The Assistant Dairy Expert (Mr. H. J. Apps) has reported on the exhibit as follows:—

"The bacon imported from Ireland, Denmark, and Canada, consisting of four sides from each country, was staged at the Royal Agricultural Show. Two sides from each bale (of four sides) were dried, pea-mealed, and smoked. A great number of persons who inspected the bacon were somewhat disappointed in its general appearance. It might be pointed out, however, that bacon which has been pea-mealed never carries the gloss and fine finish which is so pronounced in the local product. It was pea-mealed and smoked for two reasons—first, because it was very mildly cured, and there was a danger of the sides going off when exposed for any length of time, and, secondly, when it was finished in the manner described it clearly gave an idea of how the product is generally sold on the home market. One side from each bale was also pale dried, i.e., washed and allowed to dry out properly. The remaining side from each bale was left in the green state. One side of the smoked from each lot was cut for inspectional purposes.

Table showing (1) the original "green" weight, (2) weight after being treated, (3) difference between "green" and "treated" weight, and (4) the percentage loss from treatment of the imported sides of bacon under notice:—

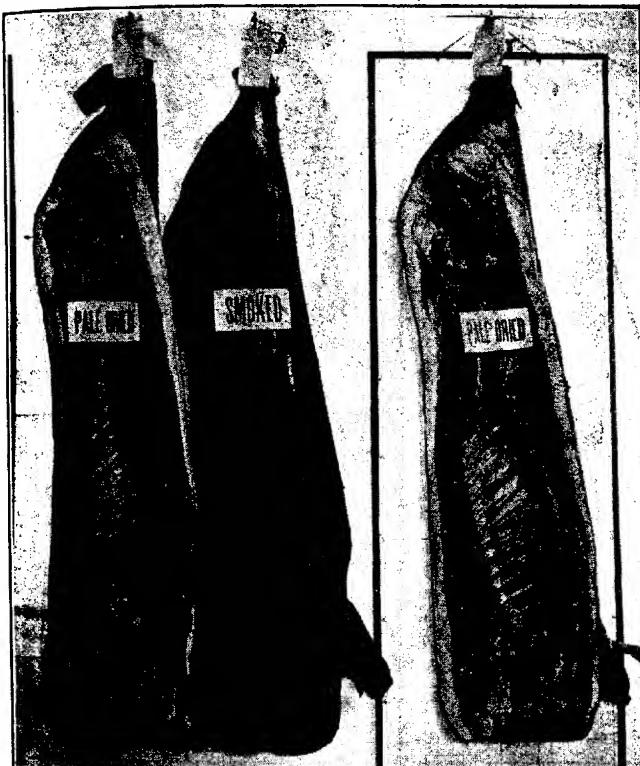
Side No.	Original Green Weight. lbs.	IRISH BACON.			Difference. lbs.	Difference. Per cent.
		Treatment.	Treatment.	Difference.		
1.	68	smoked	62	6	8.82	
2.	68 $\frac{1}{2}$	left green	—	—	—	—
3.	62	smoked	56	6	9.68	
4.	59 $\frac{1}{2}$	pale dried	53	6 $\frac{1}{2}$	10.09	
Average difference before and after treatment				9.53		
DANISH BACON.						
1.	58	smoked	51	7	12.07	
2.	58	smoked	51	7	12.07	
3.	58	left green	—	—	—	—
4.	65 $\frac{1}{2}$	pale dried	57	8 $\frac{1}{2}$	12.97	
Average difference before and after treatment				12.37		
CANADIAN BACON.						
1.	61 $\frac{1}{2}$	left green	—	—	—	—
2.	60 $\frac{1}{2}$	pale dried	52	8 $\frac{1}{2}$	14.05	
3.	56	smoked	48	8	14.28	
4.	57	smoked	50	7	12.28	
Average difference before and after treatment				13.57		

"The Irish product was certainly the best. The sides were uniform, having great length. They measured from 4ft. 5in. to 4ft. 7in., with an average length of 4ft. 6in. The back fat was very even throughout; it measured 2in. The greatest width across the ribs was 14 $\frac{1}{4}$ in. The cut side presented a nice colored flesh, and the fat was snowy white.



A Display at the Royal Agricultural and Horticultural Society Show of Typical Sides of Irish, Danish, and Canadian Bacon, as at Present Sold in the English Market.

and extremely firm. Many spectators remarked that the local curers had little to learn from the foreign competitors. Whilst I agree with them on the score of finish, yet I unhesitatingly say our local curers have a great deal to accomplish before they can produce an article which cooks like the Irish bacon. The fat does not fry out, and the lean part remains soft. Whilst many may think that the proportion of fat is too great, yet I venture to say that the cure is of such a



Danish Bacon, Wiltshire Side. Average Weight per Side, 59 lbs.

nature that it would almost cause one to wish it were greater in proportion. This opinion has also been expressed to me by some who secured a trial rasher.

"The Danish sides were not quite as lengthy as the Irish, averaging 4ft. 3in. The back fat was uniform and measured 2in. The width across the ribs was 14in. The cut side did not look as nice as the Irish, nevertheless, the fat was of a very firm nature.

"The Canadian sides were the poorest lot, and did not show as much substance as the other two. The average length was 4ft. 2 $\frac{1}{2}$ in., and the width across ribs 13 $\frac{3}{4}$ in. There was 1 $\frac{1}{4}$ in. of back fat. The cut side showed up very dull, and the fat was broken away from the lean meat, which was apparently caused by a too severe pressure in



Irish Bacon, Wiltshire Side. Average Weight per Side, 64 lbs.

pumping. The first prize exhibit in the export class (local cure) measured on the average 12 $\frac{1}{2}$ in. across the widest part of the ribs, back fat 1 $\frac{1}{4}$ in., and length 3ft. 7in.

"In all of the bacon exhibited at the Royal Show there were no sides of the same conformation as the imported article. I would therefore suggest that the Royal Agricultural Society be approached and asked to omit the present class for 'bacon suitable for export,' and substitute

in its place a prize for "green" bacon in bales of four sides suitable for export to the United Kingdom. Should the local curers desire to have particulars as to the procedure, ingredients, and length of cure, our department will supply same, and perhaps the Government may feel disposed to also offer a special prize for this particular class.

"Judging by the conformation and few traces of hair on the bacon; I should think the Irish lot consisted of Large Yorks and Large Black, the Danish Large York or Landrace, and the Canadians Large Yorks. The average live weights of the Irish pigs would be approximately 208lbs., Danish 190lbs., and Canadian 182lbs.

"I supplied several of the curers and merchants with a rasher from the cut sides, and cut a fresh rasher each morning to give the flesh a good bloom. I should say about 6lbs. or 7lbs. were used in this way. I have not received the comments of all, but some have stated that they were greatly surprised with the taste, which was excellent, and very much upset their judgment in judging the product by its appearance."

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January and July, 1921.

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THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

THIRTY-THIRD ANNUAL CONGRESS.

(Continued from page 239.)

Tuesday Morning, September 12th.

BOYS AND GIRLS' CLUBS IN CANADA.

Business was commenced on Tuesday morning with the following paper contributed by Mr. J. C. Jenner, of the Naracoorte Branch, and read by Mr. J. Corner:—

The recognition of the wisdom of placing the subject of boys and girls' clubs in your subjects for discussion has grown upon me. The subject is most important to the present and future interests of our children, our district, and State. The important position the child, youth, and maiden occupy in the community is more and more being recognised. In the various departments of life, whether religious, moral, or otherwise, in all effective and lasting reforms, young life plays a very conspicuous part. In Germany, through impressing the young in the primary schools and the youth in the secondary schools and University, the ideal of national life was changed in 50 years from "right is might" to "might is right." And so in all reforms. As one writer says—"The old are difficult to deal with, but you can give ideals to the young." As regards the history of the club movement, it seems that the idea originated in the United States. In the northern and western States in the brief space of seven years—1912-1918—the membership increased from 22,000 to 528,000, and the funds allotted for the work from £1,000 in 1912 to £16,000 in 1919. The movement spread quickly to France, Japan, Canada, and the Philippine Islands.

I have to deal particularly with Canada, and the club idea there has extended to all the provinces of that dominion. Manitoba leads the way, and my statistics are largely confined to that province. The membership has increased as follows:—1913 it was 740; in 1914, 1,800; in 1915, 5,500; in 1916, 10,000; in 1917, 15,000; and in 1919, 25,000. This is one province alone. The *Agricultural Gazette* in 1916 devoted one page out of 76 to the club work, but in the 1921 *Gazette* one of the four sections in the book uses 25 pages in detailing the club activities.

Then in regard to finances, one-seventh of the Federal grant of £14,000 was used for club work; this, of course, in addition to the provincial allowance. The progress has been very great, and the need for production in the great war helped on the movement, but thousands of pounds are not likely to be spent on wasteful objects. The value of the clubs is fully realised.

1. *What are the Clubs?*—There are groups of five (or more) young people of both sexes from eight to 18 years of age who concentrate their attention on one or more of the following subjects:—(1) Pig, calf, sheep, colt, or poultry (eggs and chickens) raising; (2) grain, including wheat, barley, oats, and maize production; (3) potato and sugar beet production; (4) ensilage making; (5) stock judging; (6) dairy produce; (7) canning of surplus vegetables and fruit; (8) cookery, bread making, &c.; (9) sewing, garment making, &c.; (10) essay writing on agricultural subjects. Members are not confined to pupils attending schools. The club work originally started in a very simple way, but the promoters of the Agriculture Extension Scheme could see its virtues and has helped it on to its present flourishing and progressive State.

2. *Objects and Value.*—The general object is to improve production, both in respect to quantity and quality, but especially the latter, and to arouse in rural children the spirit of enterprise. Resulting from the efforts there are great values. The young people learn by experience that labor brings tangible rewards, *e.g.*, a lad buys a young pig, feeds and cares for it, and ultimately reaps a good return within 12 months. A healthy emulation is encouraged in connection with the shows and contests, and even in the home between father and son. The father is often a bad second in competition with the son. An increased interest in home and farm life is developed, and this becomes an antidote to the growing desire on the part of many to get near the city. The resources of the country are improved. The thousands of young people become energetic producers of the future, and the whole effect of the club work tends to encourage the community co-operation spirit and good citizenship.

3. *Methods of Work.*—1. Each club has its own rules and by-laws. Rules constitution.—(1) Name; (2) object; (3) membership, boys and girls, eight to 18; (4) organisation, officers, president, vice-president, secretary, and treasurer; (5) meetings; (6) election; (7) amendments. By-laws.—(1) Duties and privileges; (2) officers; (3) president; (4) vice-president; (5) secretary and treasurer; (6) order of business. 2. Bulletins and other literature are published by the Department of Agriculture for the guidance of members in their work. Bulletin on Pig.—(1) Breed; (2) forage crops; (3) diseases; (4) management; (5) housing and shelters, general notes. Bulletin on Poultry.—(1) Housing; (2) selection of stock; (3) feeding; (4) hatching and testing; (5) marketing eggs and surplus birds, general notes. 3. Yearly a special day is observed to show the work of the year. This day is called Achievement Day. At it the work is judged, contests arranged, and also sports. 4. Short courses of instruction are arranged in suitable centres. The instructors come from the agricultural and technical schools. For 10 to 14 days the young people receive instruction in woodwork, ironwork, agriculture, cookery, sewing (dressmaking, &c.). Sometimes a camp is arranged for the course, the young people carrying out all the cooking arrangements in

connection with it. In Canada the work is largely done by the Education Department in connection with the primary and high schools. The public school inspectors, assisted by prominent business men and farmers, supervise the work. In Manitoba many banks are very interested in some parts of the work, the managers advancing money for the purchase of young pigs, &c., on the notes of hand of the young people. No case is recorded where the debt was not met.

4. *Results.*—Some of these from the United States of America will be interesting. In 1918—Number of clubs, 21,845; members, 527,723; members reporting results, 251,032; value of produce, £1,200,000. Pig clubs (32 States).—In 1918—Clubs, 2,331; members, 31,476; members reporting results, 12,974; animals, 24,501; pounds of pork, 4,433,000 (average 200lbs.); value, £200,000. Poultry Club.—1918—Clubs, 2,171; members, 37,723; members reporting results, 16,128; chicks, 331,000; laying hens, 40,735; eggs, 133,500 dozen; value, £80,000. Results in Manitoba in 1920.—Number of fairs held, 229. Attendance—Adults, 24,927; children, 26,607; average, nearly 2,000 people. Exhibitors, 21,000. Exhibits—Calves, 906; pigs, 755; sheep, 377; colts, 309; poultry, 3,381; dairy, 580; grain, 1,907; gardening, 14,455; cookery, 11,404; sewing, 10,521; canning, 4,611; noxious weeds, 1,641; farm mechanics, 1,469; stock judging, 117; schoolwork, 42,922. In reference to the work done by the young people, it has been stated, “The work exhibited at the fairs creates surprise on account of its excellence.” Buyers of pigs attend these fairs to buy up the animals even at an advance of $\frac{1}{2}$ d. per lb. on market price.

In conclusion, I would say I have briefly placed before you the importance, nature, methods and value of these clubs, and would suggest that your discussion centre around the need of their establishment in the district and State, and as to how a start could be made.

DISCUSSION.

Mr. Bawden (Tatiara) suggested that a travelling school in the form of a railway carriage containing agricultural produce and specimens, with a teacher on board, should be established. The carriage could be run to various rural districts. The cost would not be very heavy. Mr. R. McKenzie (Pinnaroo) said the idea was a capital one, and he believed would assist in keeping the boys and girls in the country. Mr. A. Densley (Keith) agreed that the suggested formation of boys and girls' clubs was to be encouraged. Such clubs would form a stepping stone for the boys until they were old enough to join up with a Branch of the Bureau. Mr. J. Darley (Narridy) said boys and girls' clubs should be formed in the country, with the idea of encouraging the children to take an interest in the work of the farm. The children at the Red Hill school had sold £17 worth of vegetables out of the school garden. Mr. M. McAuley (Georgetown) also referred to the work that had been done by the children at the Red Hill school. He stated that the proceeds

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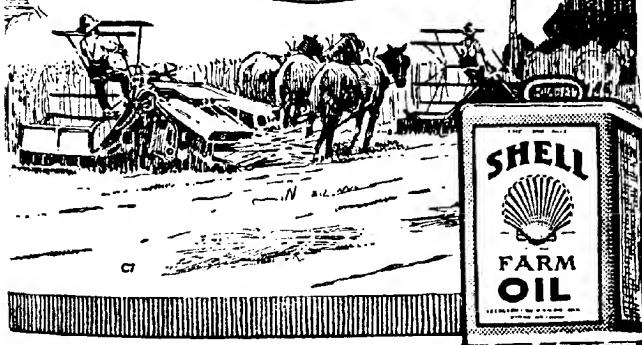
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from the sale of the vegetables were used to purchase football and cricket tools. Mr. H. Fewings (Pinnaroo) said they had had a somewhat similar experience at Pinnaroo. A garden was laid out at the local school and the children were doing excellent work. There was a special class at their show for produce exhibited by children. Mrs. Hammatt (Williamstown Women's) said the children of the local school took a very great interest in flowers, and three times a year the children were invited to exhibit the efforts of their work, which were judged by a member of the local Branch of the Bureau. The children worked most energetically, and the introduction of the scheme was making a very marked improvement on the young life of the town. Mr. H. T. Noske (Shoal Bay) said the idea of establishing boys and girls' clubs was one which could be well applied throughout the country districts of the State. He was of the opinion that the Department of Education should allot a certain portion of the lessons in country schools to teaching the children the cultivation of vegetables and other crops, and that rural schools should be given more grounds in which to carry out that work. Mr. H. S. Taylor (Renmark) then moved, and Mr. J. Steed (Rockwood) seconded, "That the Advisory Board be asked to investigate the possibilities of establishing boys' and girls' clubs in South Australia, and that the Board inquire into the work that is being done in other States." The motion was carried unanimously.

HERD TESTING SOCIETIES.

The Director of Agriculture (Professor A. J. Perkins) delivered an address on "Herd Testing Societies." His remarks were illustrated by a number of tables, which showed how such societies tended to increase the yield of dairy produce. The mean yearly output for each cow in South Australia from 1914 to 1918 was 305 gallons. At 9d. a gallon the return from the 152,178 dairy cattle in the State would be £1,740,535. If the output were increased to 500 gallons for each cow the value of the increased production, without any increase in herds, would be £1,112,781. He explained the Government subsidisation scheme at some length, and gave the estimated cost of running a herd testing society, and explained how the mean annual output from each cow in any herd was secured. It was sometimes asked why the Government did not undertake the testing, but to do so would require a small army of officials, and there would not be the same keenness and spirit of emulation that the society system fostered. The results of the first year's operations of the River Murray Herd Testing Society, 1920-1921, showed that the mean value of output as whole milk was £31 8s. 3d. and the mean value of output as cream and skim milk was £24 19s. 3d. The basic principle of the system was to increase the average output of every cow for 12 months. A second society had been formed at Mount Gambier, and he believed it would be as successful as the one at Murray Bridge. There were prospects of still another society being established in the north, probably at Laura. It would be found that wherever a society was established the output would increase.

SUCCESSFUL METHODS OF AGRICULTURE IN MALLEE COUNTRY.

The following paper was read by Mr. A. J. A. Koch, Lameroo branch:—

Having farmed for 15 years in the mallee with more or less success, and having during that period had to be ever on the watch for crop diseases and methods of farm practice that would build up our land to its top producing capacity, and having adopted a system that is gradually proving itself in our immediate neighborhood, I have been requested to set it out in this paper for those of our neighbors in other mallee districts to criticise, or to try out on their own particular holdings. I do not claim in this practice any new thing, nor is my farm one of especial quality, as far as land is concerned, nor is it of more than 1,000 acres.

With nothing new, but by making use of what we already know, and using it to its utmost, my neighbors and myself have increased our farm average from 10bush. to 12 bush. in 1909-1913, to from 16bush. to 18bush. over the period 1915 to 1922.

It will be necessary to become retrospective for the moment, and recount early experiences to lead up to present-day farming practices.

In the dawn of agricultural occupation here, the farmer who had a cultivator, drill, and harrows, and used them at the right time, grew satisfactory wheat crops; indeed, so much success was achieved by lax methods, that it led to the belief that good crops could be grown under any careless system. We were taught very hard lessons even in good years by the failures that attended these methods, and even now much prosperity is being missed because so many refuse to see the lean reward for their labor.

By the year 1916 mallee shoots were mostly killed, sticks and rubbish were got out of the way, and the rotation of fallow-wheat-oats followed more keenly and closely. Fences were being erected, and the subdivision of the land into smaller fields helped considerably towards its success. This rotation is now general; but the inability to grow heavy, consistent crops of oats on stubble is demanding a change. To grow more feed, on a smaller area, more oats on fallow, and not large areas of stubble land, and make room for greater areas of wheat each year is the system we are looking for.

The treatment of our fallow is our first care; to start as early in June as possible, and to finish before the end of August is our aim. Personally, I like to harrow each field as ploughing is finished, but if I have to choose between two alternatives, fallowing in September or harrowing in September, I decide on the latter course. I usually work my sheep hard on the fallow paddocks, and keep the cultivator going. If it is too hard, such as the first ploughed is likely to be, I use any of the spring-time cultivators; but if at all set, the tine cultivator will have to be used. The number of times that the land is worked is not always a matter determined by the growth of weeds, but by rain. If a late rain falls, especially during hay time, I would

and have, let my hay carting by contract, and kept the team on the fallow. To get my cultivator (I do not use the harrows at this time of the year) over as much of the land as possible after harvest rain is considered very important, and harvest work takes second place on occasions when this opportunity offers.

Many farmers assert that sheep are the cheapest implement to work. I find that they have an important part to play, but if left to do the whole of the work, there is a hard surface instead of a dust mulch formed, and a hollow instead of a firm feel under foot; consequently the fallow breaks up in rough clods of soil and matted colonies of charlock and other seedlings. We find that to cultivate twice immediately prior to seeding gives us an ideal crop foundation, and with that end in view, get over our fallow in the order in which it is going to be sown, and then go back and start cultivating in preparation for seeding. This method makes us a little later, but the extra working at this season seems now to be essential. To harrow before as well as after, the drill entails more work, but makes a thorough job.

On referring to the practice adopted by the competitors in the Lameroo Farm Crop Competition of last year, I find that the heaviest yields of the eight crops entered were on that land fallowed in June and July, and that the entrants practised the methods of cultivation set out in this paper.

The best plot averaged 26bush., and the average of the seven plots was 22-3bush. per acre. I may say that these areas for competition were not especially treated, but received the same cultivation as the balance of the fallow on each farm. They were not all on the best land procurable on each farm, but on the whole would be better than the average contained in the Pinnaroo district.

The varieties and quantities of seed are always a matter of opinion and local conditions. I used at one time to sow a bushel to the acre as a maximum. Wimmera practice shows that whilst a return of 15bush. to 20bush. could be obtained by applying this quantity, the application of from 65lbs. of late, to 90lbs. of early varieties gave them from 20bush. to 30bush. crops. Knowing this, I commenced seeding more heavily, and now use 60lbs. to 65lbs. as a minimum of late wheat, and up to 80lbs. of early, all of which is graded and weighed before sowing.

Results achieved are the greatest recommendation of the above practice.

In 1915-16 my best crop was Federation; yield, 19bush. The farm average for the season was 16½bush. per acre.

1916-17. Best crop, Yandilla King, 28½bush. per acre, followed by Federation, 26½bush. In that year I conducted manure experiments on measured acres. Each was sown with 56lbs. of Yandilla King per acre and amount of super., and results are as follow:—40lbs. super. result 22bush. 40lbs.; 80lbs. super., result 25bush. 32lbs.; 150lbs. super., result 28bush. 10lbs. The farm average for the season was 24bush.

In 1917-18 Yandilla King, over 90 acres, returned 23½bush., followed with Marshall's on 70 acres, 22½bush., and Federation on 70 acres, 21bush., the farm average being 21bush. for the season.

In 1918-19 the best crop was Marshall's No. 3, on 6½acres, which returned 24bush.; Yandilla King on 36 acres, averaging 22½bush.; the farm average being 18bush.

1919-20 was exceptionally dry. The mallee was nearly as bad as 1914 in many of the newer districts, just as bad as far as a wheat crop was concerned. It paid to cut wheat for hay, and I cut Yandilla King, averaging 1½ tons per acre, and reaped wheat up to 15bush. on my best fallow, the farm average being 9bush.

1920-21. Gluyas Early, which was top, was sown on June 14th with 101lbs. of super. and 75lbs. of seed, and yielded 24bush., the farm average being 20bush. per acre.

In 1921-22 Federation was the premier crop, sown at the rate of 68lbs. of wheat and 95lbs. of 45 grade super.; it returned 24bush. It

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was sown on June 20th and 21st. Yandilla King, sown on June 3rd and 11th, with 60lbs. of wheat and 90lbs. of similar super., resulted in 21bush. being reaped, the farm average being 18½bush.

Reviewing the seven years above enumerated, it will be seen that an average over that period of 18bush. per acre has been secured. Previous to November 18th of last year, which was the hottest November day in South Australia for 24 years, crops gave promise of extremely heavy yields, and the judges who officiated at the above-mentioned competition, basing their points on a maximum of 30bush. per acre, found it necessary to adjust them for even higher yields. The judging took place on that memorable day, but the yields fell short of actual promise by bushels per acre. I have given wheat returns only, that being our staple crop. Oats have been sown over the whole of previous wheat stubble, generally after burning off, and used as a grazing proposition or cut for hay. The yield in 1919-20 was only 3bush. per acre; in 1920-21 an estimated yield of 1½ tons per acre was cut, and 1921-22 gave 27ewt. per acre.

This secondary crop has provided us with hay for stock, and we have been able to store up fair quantities for the future.

I have followed the above practice for 11 years; but this year have changed it, so that I will not in the future be sowing any stubble land except a field for grazing purposes each year. My future oat crops will receive the same careful treatment as the wheat, with a view to lesser acreage and greater aggregate returns. I have sown peas with variable success, and whilst I recognise it as a fine soil tonic crop, and also one that gives much feed per acre for sheep, I am doubtful whether I will be able to find a place for it in the future, unless on a part of the field fenced off and sown for grazing in conjunction with barley and oats.

DISCUSSION.

Mr. A. Shannon (Keith) was of the opinion that the quantity of seed per acre suggested by the writer of the paper was extravagant. He considered that there was a great danger in sowing large quantities of seed wheat, especially on the poorer classes of soils. The Superintendent of Experimental Work (Mr. W. J. Spafford) congratulated Mr. Koch. The results he had achieved were remarkably good. The quantity of seed wheat to be used appeared to hinge on weed control. When land was first cropped maximum returns would be secured from 30 to 40lb. of seed per acre, but after the third crop the quantity had to be increased, especially on the limestone country. It was not unusual in other countries to sow five bushels of wheat per acre, and up to seven or eight bushels of oats. He did not agree with the cutting out of oats as a stubble crop. Mr. Koch's paper was one of the best on farming in the mallee he had heard. Messrs. W. J. Dawkins and F. Coleman (members of the Advisory Board of Agriculture) complimented Mr. Koch on his paper. Mr. Dawkins said Mr. Koch was looked upon as one of the best farmers in the mallee country.

Tuesday Afternoon.

IS THE GROWING OF BARLEY OR OATS AFTER WHEAT PROFITABLE.

Mr. A. W. Clarke, a delegate from the Tarlee Branch, read the following paper:—

It is generally recognised that land does not require the same preparation to grow barley and oats that it does for wheat, and the sowing of the stubble with these cereals has been getting some strong supporters lately. Barley and oats can be sown for early feed, after which the stock can be taken off and the crop harvested, or they can be sown after the wheat has been drilled in. I am not in favor of the first method unless the land is fairly clean, otherwise the weeds will make more headway than the crop and choke out the plants; especially is that so with malting barley and oats. There is not the same trouble with Cape barley owing to it being a stronger grower. If you do follow that method, whether you sow with Cape barley or the other two cereals, I would strongly advise you to have a good look at it and see if the crop will be able to stand against the weeds, if not it will pay you better to keep on using it for feed.

With the second method, which is to sow after the wheat is all drilled in, you have every prospect of getting a good clean crop, and it is reckoned that land that will yield a 20bush. crop of wheat on fallow will yield 30bush. of Cape barley on stubble, and nearly as much malting barley and oats. At first glance it would appear that with the less work in preparing the land and the larger returns per acre, the proposition was a very profitable one, but the great difficulty at present is to get a market for the cereals. Last year the area sown with barley and oats in South Australia was just over half a million acres, whilst nearly three million acres were devoted to wheat. Of that three million acres it could be safely said that one and a half million acres were grown on fallow. What would happen next year if that million and a half acres had been put in with barley and oats. With the half million acres garnered last harvest the price for Cape barley has been

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about 2s. 6d. a bushel, with a little more for malting barley and oats, and, unlike wheat, there does not seem to be any chance of an export market. So that should the sowing of stubble with barley and oats become general throughout the State, and the corn be thrown on the market, the price would hardly be sufficient to pay for sacks and carting out of the paddock. Fortunately that is not the only way of marketing the crop. There is a profitable market at present for a limited supply through livestock, and also a prospect of a market for it all that way. The value of oats for the feeding of horses is well known, and if farmers were to use more oats with chaff they would find that they would not want nearly so much hay, and also that the horses would be in better heart for their work. Again, oats have been proved to be equal to bran for increasing the flow of milk in cows. In the last drought in New South Wales it was found that the most economical way of hand feeding sheep was with grain, and of all grain oats were by far the best, and especially was that so with ewes and lambs, and I feel certain that it will pay most farmers who have a small flock of ewes to sow oats in order to have a standby during autumn, when most of the summer feed is gone. Take last April and May for an example. When the feed was getting scarce and the lambs were being dropped, some of the lambs were very miserable, and others had been left by the ewes, whereas if each ewe had been given $\frac{1}{2}$ lb. to $\frac{1}{4}$ lb. of oats daily with the other feed such a happening in all probability would have been avoided. Also a lot of lambs received a severe check through the ewes not having the milk to feed them after they were born. The wool of those ewes would receive a check as well, so that the extra price that would have been received for the lambs and wool through giving them the oats would have made the sowing of a portion of the stubble with oats a very profitable undertaking. With barley there is practically only one way of marketing the grain, through livestock, and that is chiefly pigs, although it can be fed profitably to horses and sheep when oats are unavailable, yet it has not the same feeding value for them that oats have, but for the production of pork and bacon of first quality there is no doubt that barley is the best of all grain. It has been stated by Professor Perkins, in the *Journal of Agriculture*, that if farmers could depend upon a minimum of 4d. a pound live weight for their pork it would pay them to grow barley as a second crop and feed it to pigs. Here again we are up against the difficulty of finding an export market, for it is useless relying on local consumption, but England is a big importer of pig products. In fact, in 1919 the pig product—that is, bacon, ham, frozen and salted pork, and lard—realised £109,000,000, while wool, which was next on the list, was £96,000,000. Of that total for pig products, about 94 per cent. came from America and Canada. Why should not we be able to export as well as Canada and the United States? The standard of living and wages are just as high, if not higher, there than they are here, and whereas America grows and feeds with maize, we can grow barley, which is even better for pigs. Even before the war America was supplying over half of England's bacon, while we here in Australia were doing practically nothing. If an export market for the pig is established, barley on stubble can be grown very profitably.

But does the growing of barley on a farm mean that that farmer's wheat will never be free from barley? Also, does it exhaust the land for the next wheat crop? Take the first question. I suppose nobody likes to see vigorous heads of barley waving over the wheat crop, but if you were to take a look around you will see those heads of barley in the crop of the man who never sows a barley crop as well as in the crop of the man who does, and you will invariably find that the barley was in the wheat before it was sown. At Roseworthy Agricultural College they have grown the barley rotation for years, and also have fed it to pigs, and occasionally to horses and cows, and anyone who has had seed wheat from there knows how free from barley it is. Of course, there are precautions to take. They are when seedling and harvesting to see that the machines are thoroughly clean when passing from barley to wheat or oats, for oats suffer just as much as wheat does in that respect. Also, if fed to livestock it should either be crushed, soaked, or steamed, and if that is done there is no reason why you should get the barley in your wheat because you are sowing both.

Take the second question. Does barley exhaust the land for the following wheat crop? Let us take the rotation crops of barley and oats with wheat, and compare them with that of wheat by itself grown on the experimental plots of the Boorooroo Experimental Farm, which cover a period of six years, from 1915 to 1921. I will give you the average returns per acre for the six years. All wheat was sown with 2ewts. of super.

Rotation.	Wheat		Barley		Oat	
	Average.		Average.		Average.	
	B.	L.	B.	L.	B.	L.
Bare fallow	27	17	—	—	—	—
Bare fallow—wheat—barley (1cwt. super)	32	33	19	33	—	—
Bare fallow—wheat—oats (1cwt. super)	33	2	—	—	35	4
Pasture—bare fallow—wheat	31	49	—	—	—	—
Pasture—bare fallow—wheat—barley (2ewts. super)	32	51	27	38	—	—
Pasture—bare fallow—wheat—oats	34	28	—	—	31	8

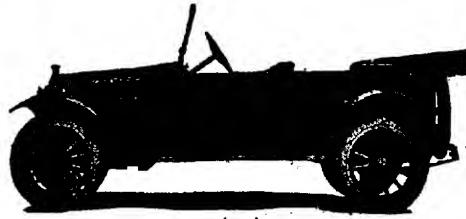
You can see from those returns that the rotation of wheat with barley and oats has increased the yield of wheat, instead of lessening it. Another fact is also brought out about barley by those trials, for if you remember I stated earlier that land that will yield a 20bush. crop of wheat will grow 30bush. of barley, and here we have land yielding over 30bush. of wheat and barley only going 20bush. The reason is that land that will yield large crops of wheat will often yield less barley, for whereas wheat may be described as the cereal thriving best on the rich, heavier types of soil, and rye on the lighter, sandy soil, barley is to be seen to the best advantage on the intermediate soils. In very rich soils, or soils in high condition, barley is almost invariably too rank in growth for heavy yields of good grain. The crop is readily lodged by rough weather or apt to blight off on the first touch of summer, so that it would be pinched, weigh light, and be of low commercial value. At Roseworthy College, where we have the intermediate soil, the average return for wheat from 1904 to 1911 was 18bush. 23lbs. per acre, while the returns for Cape barley were 36bush. 23lbs., so

that their barley crops were as profitable as the wheat. Also, wheat sown with the barley rotation for the period of 1911-1915 yielded 17bush. 43lbs., as compared with 17bush. 6lbs. under the bare fallow wheat, pasture system. Here again, even with the big yields of barley, wheat increased in yield rather than decreased. In preparing the land for the growing of the secondary crop you will have to burn off the stubble, and thereby lose some of the summer feed, but once this rotation of cropping is established you will find that oat and barley stubble is almost invariably better stocking than wheat stubble, so in the end you would be more likely to gain than lose. Also, there is a certain percentage of grain lost during the harvesting, which produces earlier and better feed than is usual in wheat stubble. There is no doubt that with the gradual decrease of the area of farms, and the big price land is bringing, the farmer will have to increase his returns to make a living, and if a profitable export market can be found for either the grain or the stock the sowing of the stubble with barley and oats will be one way by which he may increase his returns, and even as the market is to-day it will be profitable to sow enough stubble to provide some oats for the horses while they are working, also for cows and sheep during the dry time in autumn, and enough barley for a few pigs; but on no account will it pay to neglect the sowing of wheat on the fallow to sow oats and barley on stubble.

During the discussion which followed, Mr. W. J. Colebatch (Principal Roseworthy Agricultural College) congratulated the writer of the paper, and said it was the duty of those upon whom the responsibility rested to see that adequate instructions were issued regarding the growing of secondary cereal crops. The sowing of oats or barley depended upon climatic conditions, but oats should be sown before the wheat crop, and before the rain if the rain did not come in time. He preferred oats to barley because the former was a better feed for horses. There was nothing in the contention that growing barley rendered the wheatfields dirty.

Professor A. J. Perkins (Director of Agriculture) said that the policy of growing secondary crops was being adopted at the Turretfield Demonstration Farm. It was planned that the 1,200 acres of arable land at Turretfield should be utilised as follows:—400 acres of wheat, 400 acres of bare fallow, 200 acres under secondary crops, and 200 acres under secondary crops for grazing purposes.

Mr. H. W. Kenner (Two Wells) preferred oats or pease as a second crop. He advocated sowing oats early, and before the rain if it did not come in time. Mr. J. M. Hudd (Hartley) also preferred oats as a second crop. Calcutta Cape oats was best suited to the Hartley district, and was relished by the horses. The average yield of oats in that district was approximately 30 bushels per acre. Messrs. C. M. Hudd (Black Springs), T. H. Howlett (Arthurton), and A. W. Shannon (Keith) also spoke, the consensus of opinion being that oats were preferable to barley as a secondary crop.



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ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Friday, October 13th. Mr. F. Coleman presided, and there were also present the Director of Agriculture (Professor Arthur J. Perkins), Messrs. T. H. Williams, A. M. Dawkins, and the Secretary (Mr. H. J. Finnis). Apologies were received from the Minister of Agriculture (Hon. T. Pascoe, M.L.C.) and Messrs. W. S. Kelly and H. Wicks.

Experimental Farm on Swamp Area.—A recent Conference of River Murray Branches of the Agricultural Bureau carried the following resolution:—"That the Government immediately acquire or set apart a swamp area as an experimental farm for dairying and the growing of fodder crops under the superintendence of the Agricultural Department." An intimation was received from the Minister of Agriculture that no action could be taken at present.

Combating the Dried Fruit Moth.—The Lone Gum Branch, which was instrumental in having a motion carried at the annual Bureau Conference recently, that steps should be taken to combat the moth which attacks dried fruit, asked the Board to request the Federal Government to take steps to eradicate the moth. It was decided that the Secretary of the Board (Mr. H. J. Finnis) and the Horticultural Instructor (Mr. G. Quinn) should confer with a view to framing a scheme.

Increase in Time Allowed for Loading Trucks.—A resolution was carried at the Conference of Upper Northern Branches of the Agricultural Bureau asking that the Government should allow outside districts, say, seven miles and over from railway stations 12 hours before demurrage should start on goods, especially sugar. The Railways Commissioner reported that having regard to the serious detention of trucks, which would be the result of increasing the time allowed for unloading, he was unable to agree to the proposal. The Secretary was directed to interview the Commissioner and ask him to apply the concession to districts where there were sidings only, and farmers had no means of employing agents or others to unload goods.

Reduction in Railage Charges on Exhibits.—An intimation was received from the Railways Commissioner that he had agreed to carry exhibits for Agricultural Bureau Conferences under the same conditions as exhibits for agricultural shows.

Losses of Stock through Eating Stinkwort.—Correspondence was received from the Tatiara Branch stating that several farmers in the district had lost a number of sheep through eating stinkwort. The matter was submitted to the Chief Inspector of Stock (Mr. T. H. Williams) who, in the course of a report, expressed the opinion that if hungry sheep were put on flowering stinkwort to graze there was

likely to be a percentage of deaths. If the plant had been moistened by rain it was likely to be more toxic than when dry. The Secretary was instructed to forward a copy of the report to the Branch.

Eradication of Woolly Aphis.—A resolution was received from the Blackwood Branch asking the Government to experiment in methods of eradicating woolly aphid. It was decided to ask the Horticultural Instructor (Mr. Geo. Quinn) to report on the matter.

Water Conservation Scheme, Blackwood.—The Blackwood Branch also carried the following resolution:—“That the water scheme of the Blackwood Progress Committee is not in the best interests of the fruit and vegetable growers along the banks of the Sturt.” The Board was of the opinion that the matter was one that did not come within its scope and instructed the Secretary to inform the Branch to that effect.

Delays in Transporting Stock on Railways.—A resolution was received from the Morchard Branch asking the Advisory Board to use its influence to secure the quicker dispatch of stock on the railways to the Abattoirs. The Secretary was instructed to ask the Branch for specific instances of delay in transportation.

Congress Resolutions.—The following resolutions were carried at the 33rd Annual Congress of the Agricultural Bureau:—(a) “That this Congress urges on the Government the necessity for introducing legislation to control the sale of farm and garden seeds.” The Board decided to forward the resolution on to the Minister in support of its previous recommendations. (b) *Eradication of Lucerne Flea.*—“That in the opinion of this Congress immediate steps are necessary to cope with the lucerne flea with a view to its eradication, and expresses approval of the steps that are being taken in dealing with this pest.” The Secretary reported that tests were at present being carried out and that a report of the experiments would be published. (c) *Reduction of Import Duty on Sulphur.*—“That the import duty on sulphur be reduced.” The secretary was instructed to forward the resolution to the Minister with a request that the matter might be brought under the notice of the Tariff Commission.

Freight on Perishable Produce on Railways.—The Conference of Hills Branches resolved:—“That the Advisory Board be asked to interview the Railways Commissioner in respect to the freight on all perishable produce on railways.” The Secretary was instructed to inform the Branch that the Board was not prepared to take any action in the matter because it considered the rail rates at present charged for fruit compared favorably with those charged for other lines of agricultural produce.

Appointment of Members of the Advisory Board.—Correspondence was received from the Hon. the Minister of Agriculture intimating that he had invited the President of the Royal Agricultural and Horticultural Society and Mr. Leslie Cowan, B.Sc. (Agric.) to become members of the Advisory Board of Agriculture.

Life Membership.—The names of Messrs. H. G. Tossell, Maitland and F. W. Roediger, Gawler River, were added to the list of life members of the Agricultural Bureau.

New Members.—The following names were added to the rolls of existing Branches:—Windsor—R. C. Ford; Tarlee—A. Cory; Renmark—F. Cunningham; Lenswood and Forest Range—V. C. Waters; Kongorong—H. Johns; Balhannah—J. Johncock; Crystal Brook—M. Laubsch, K. Sidwell, R. Knaggs, A. M. Crawford, W. Greig; Clare—H. W. Moss; Mount Barker—H. R. Hayward, A. S. Pledge, K. Pledge; Hartley—G. H. Cleggett, J. B. Natt, S. Tugwell, J. A. Forbes, H. Howard; Nelsaby—L. C. Roberts, A. M. Lawrie, T. B. Jose, F. Jose, M. Aniols, E. T. Franks, C. Plenty, J. S. Edwards, S. Sprott, S. R. Mills, W. Stolte, P. J. Shinnick, A. Wauchope, J. M. Shinnick, T. D. Haines, L. Engrtram, R. Bain, A. Bain; Orroro—H. G. Matthews; Naracoorte—R. G. Lock; Maltee—B. F. Wedding, W. Walker; Eurelia—E. C. Dowd; Roberts and Verran—H. Lewis; Morchard—S. Davill, W. Martin, jun.; Georgetown—G. Nankivell, G. S. Matthews, S. T. Nancarrow, J. J. Angley, W. C. Barrett, —, Munt, G. Hamilton, R. L. B. White, —, Peters, M. McNamara, M. Matthews, J. A. Lyons; Lameroo—C. Needs; Rendelsham—J. Manhood, J. Brown; Petina—A. H. Johnson; Waikerie—C. Kelch; Clare—J. Castles; Williamstown Ladies'—Mrs. A. Springbett, jun.; Halidon—L. Pope, A. Bell, H. W. Bird, J. Karlsson, Chas. Hemmingsen, Phil. Clonan, F. Window, L. Clonan, Walter Burnard, Wm. Burnard, E. B. Pope, L. S. Seymour, S. J. Grigg, G. Vinall, H. Williams, J. Duncanson, L. B. Seymour; Kangarilla—S. Paddick, R. Golder, E. Hains; Lipson—E. J. Barrand, C. Partington, R. C. Carr, W. A. Oswald, W. R. Blacker, H. H. Swaffer, S. L. Swaffer, W. E. O'Connor, W. S. Brown, E. Treasure, F. Pugsley, D. C. Stewart, T. E. Hudson, A. B. Wishart, Thos. Partington, S. F. Potter; Kilkerran—S. Jones; Rapid Bay—J. Mc. Adam, M. Ryan; Yadnarie—H. Weiss; Parilla—J. P. Ryan, A. Ryan, L. J. T. Foale; Lone Gum and Monash—W. J. Shaughnessy; Black Springs—W. H. Turner; Pata—J. Butterfield, E. J. Budiek; Blyth—A. J. Davidson, E. A. Jericho; Currency Creek—W. Saltmarsh, A. Wakefield, J. T. Burgar, J. H. Bastain; Balhannah—W. W. James, H. Pearson; Parilla, Well—C. C. Herbig; Murray Bridge—V. T. Bartlett, W. S. Payne; Currency Creek—G. Plummer, D. J. Gordon, H. Higgins, D. Kingsland, P. H. Kilsby, A. Plummer, B. Plummer, R. Plummer, J. Fuller, M. Dix, G. Fidock, W. Shipway, H. R. Pitt, G. Cockshell, J. W. Pitt, R. J. Henley, D. Kemp, H. P. Kemp, N. Holme, F. H. Scott, H. O. Sando, G. Holmes, G. H. Crossman, S. Green, H. Brynes, B. W. Henley.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

REPORTS OF CONFERENCES HELD AT VEITCH, CHERRY GARDENS, AND MINNIPA.

1. MURRAY MALLEE LANDS CONFERENCE (VEITCH.)

The Annual Conference of Murray Lands Branches of the Agricultural Bureau was held at the Government Experimental Farm, Veitch, on October 3rd and 4th. Mr. A. M. Dawkins and Capt. S. A. White (Members of the Advisory Board of Agriculture), Professor Arthur J. Perkins (Director of Agriculture), Mr. W. J. Spafford (Superintendent of Experimental Works), Mr. P. H. Suter (Dairy Expert), Mr. C. P. Hodge (Instructor for Mallee Lands), and Mr. H. J. Finnis (Secretary of the Advisory Board of Agriculture), represented the Department of Agriculture, and there was a representative gathering of delegates from the Branches constituting the Conference District. Mr. T. Long presided, and, in the course of a short address, extended a cordial welcome to the visiting officers and delegates. He referred to the fact that the present occasion was the first on which the Murray Lands Branches Conference had been held at the Government Experimental Farm. He considered that the Farm was an ideal place at which to hold the Conference. The farmers, by such visits of inspection, were able to obtain some idea of the work that the Government was doing through its Department of Agriculture. He trusted that the gathering would become an annual fixture. He then called on Mr. A. M. Dawkins to open the Conference.

The Advantages of Conferences.—Mr. A. M. Dawkins (Member of the Advisory Board of Agriculture) said the meeting together of agriculturists in conference was one of the best means of distributing knowledge and information. The attendance of so many young farmers was an excellent indication of a desire to learn. Conferences also afforded opportunities for delegates to place before the Departmental Officers those problems which confronted them in their daily work. He then discussed the advantages that had accrued to the State from the work done by the Department of Agriculture. He thought the practice of holding District Conferences on the Government Experimental Farm an excellent idea, for there was no doubt that seeing the work with the eye conveyed a much better impression to the mind than reading the story in print. He then declared the Conference open.

Welcome to the Government Experimental Farm.—The Director of Agriculture (Prof. A. J. Perkins), extended a hearty welcome to all present. The holding of such gatherings on the Government Farms was first suggested by Branches on Eyre Peninsula, where Conferences had been held at the Minnipa Experimental Farm each year for three successive years. The present Conference was the outcome of a resolution carried at the last Murray Lands Conference at Karoonda. The

Government Farms should be visited to a greater extent by the farmers in the surrounding districts. Such institutions could assist farmers by demonstrating to them the most up-to-date methods and practices, and working out problems for which the average farmer had neither the time nor the money. Recently the Government had decided that one of the Government Farms, Turretfield, should be run for profit. In so far as the first year's operations were concerned, they had been successful. On a farm worked on a commercial basis it was possible to determine exactly the total cost of different operations connected with crop growing. Records of cost of crop production, which had been kept for a number of years on a Government Farm, should prove of great assistance to farmers. If, however, they wished to have all the Government Experimental Farms worked on those lines, then experimental work would have to go by the board. The Department certainly collected as much revenue as possible from the Experimental Farms, but beyond that they could not very well go. A commercial proposition and an experimental undertaking could not both be worked on one farm at one time. The Department had two farms in the mallee, one at Minnipa, and one at Veitch, and the work on both was gradually approaching normal farming conditions. Veitch Farm had an area of 3,800 acres, 2,200 acres of which were cleared, and 160 acres rolled, which would be cropped next year. The area under crop during the present year was 750 acres. There were 600 acres of bare fallow. One hundred and sixty acres were devoted to the various experimental plots. They only had from 9in. to 10in. of rain during the growing period of the wheat, and for seven years the unmanured plots averaged 14bush. per acre on land that had been completely cleared.

Barley Growing and Pig Raising.—The Director then dealt with the results that had been secured from the manurial, cultivation, and variety tests on the farm, and mentioned that manurial tests were also being conducted with barley. The reason for this was that on the Veitch Farm they had a large area of light land. Light land was better adapted to barley growing than wheat growing. It was unfortunate that, whilst there was a ready market for wheat, the market for barley was doubtful, and it was not likely that it would be developed to any great extent. Barley could be fed to a variety of livestock, but best of all to pigs. The pig market was very precarious, but he still held that such need not be the case. If only an export market could be established for cured pork, the farmers could produce as many pigs as they wished. If the Government Farm made a success of the pigs, it was possible that some of their neighbors would follow suit. Sooner or later mallee farmers would have to adopt some form of livestock. The Department had recognised that the mallee was a most healthy place for rearing stock, and had made a practice of sending young stock from the Kybybolite Experimental Farm to develop. The Veitch Farm now carried 80 horses, 11 cattle (including one bull), 620 sheep, and 180 pigs. As the farm developed he considered it should be capable of carrying 1,000 sheep of the Merino type. He hoped that the discussion would prove profitable, and assured the delegates that the main

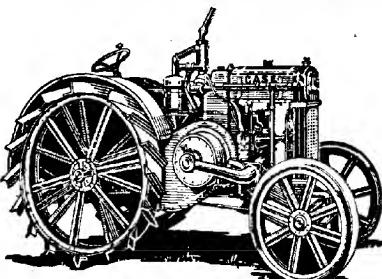
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object of the Departmental Officers was to assist those who had a desire for knowledge. He trusted that the Conference would be a successful one.

Papers and Discussions.—A paper by Mr. J. H. Priest (Wynarka), "Breaking in the Farm Colt," was read by Mr. C. Waterhouse. The writer of the paper described the procedure he adopted in handling young horses, and an interesting discussion, largely centreing around the wisdom of handling the foal at an early age, resulted. The afternoon session was opened with a paper by Mr. E. W. Cowled (Borrika), entitled "Seeding Methods and Implements," in which the writer dealt at length with the relative advantages of the combined drill and cultivator and separate implements for the same purpose. In the course of Free Parliament, the Director of Agriculture (Prof. A. J. Perkins), and the Superintendent of Experimental Works (Mr. W. J. Spafford) replied to a number of questions that had been submitted by various Branches. The evening session was commenced by the reading of a paper by Mr. F. Hondon (Paruna), in the course of which the speaker expressed the opinion that the present area of many of the farms in the mallee was too large. He contended that the subdivision of the holdings into smaller properties would result in increased production, more population, and better roads and educational facilities for the settlers in the mallee areas. A spirited discussion followed the reading of the paper. The Dairy Expert (Mr. P. H. Suter) then gave a short address on "Dairying." Wednesday morning and afternoon were devoted to a general inspection of the crops, buildings, and stock of the farm, and an open air lecture on the "Conformation of the Dairy Cow" by the Dairy Expert (Mr. P. H. Suter). The Conference terminated on Wednesday evening in the local hall, when Capt. S. A. White, C.M.B.O.U. (Vice-Chairman of the Advisory Board) delivered an illustrated lantern lecture, "Across Australia—From Adelaide to Port Darwin and Back," to a very large audience. It was unanimously decided that the next Conference should be held at the Veiteh Farm.

2. CONFERENCE OF HILLS BRANCHES (CHERRY GARDENS.)

Branches of the Agricultural Bureau situated in the Hills District met in Conference at Cherry Gardens on Thursday, October 12th. The Department of Agriculture was represented by the Minister of Agriculture and President of the Advisory Board of Agriculture (Hon. T. Pascoe, M.L.C.), the Horticultural Instructor (Mr. Geo. Quinn), and the Secretary of the Advisory Board of Agriculture (Mr. H. J. Finnis). There was an excellent attendance of delegates from the surrounding Branches. The Chairman of the Cherry Gardens Branch (Mr. D. Mc. Ricks) presided over the gathering and, in a short address, extended a cordial welcome to the visiting officers and delegates. The Minister of Agriculture (Hon. T. Pascoe, M.L.C.), in the course of the opening address mentioned his pleasure at seeing the office of Chairman of the Cherry Gardens Branch occupied by one of the young men of

the district. Much of the success of the Bureau rested upon the young men taking up the responsible positions of the Branch as the older members relinquished office. So far as the Bureau was concerned, the organisation had much of which to be proud, and it was most gratifying to learn that a keen interest in its work was being maintained by the men on the land. Some time ago a desire was expressed by the Southern District Conference that their district should have a representative on the Advisory Board of Agriculture. A gentleman who had done much for that district, and especially for the dairying industry, Mr. Leslie Cowan, B.Sc., had been invited to accept a position on the Advisory Board of Agriculture. Also, a tremendous amount of good work for the producers in South Australia had been done by the Royal Agricultural and Horticultural Society, and, with the idea of getting the Agricultural Bureau and the Royal Agricultural and Horticultural Society in closer touch with one another, he had decided to invite the President of the latter organisation to occupy a position on the Advisory Board of Agriculture. The Minister said he was pleased to see that the people in the Hills District were interesting themselves in the erection of cool stores locally on the co-operative principle. One of the advantages of that was that the orchardists were able to pick their fruit and hold it in storage so that it could be placed on the market in the best possible condition. Throughout the various districts the Government had established experimental farms and orchards, and if the primary producers would only pay more frequent visits to those institutions, he believed that the lessons that could be learned would result in a better average production for the State. The Government did not expect the Government Farms and Orchards to pay as they would a commercial proposition. He hoped that fruitgrowers would keep in close personal touch with the work being done at the orchard at Blackwood. He then declared the Conference open. A paper was contributed by Mr. W. Hughes (President of the Longwood Branch), entitled "Suggestions to Improve Interest in Bureau Meetings," in which the opinion was expressed that the exhibition of various forms of farm produce would help to create a keener interest in Branch meetings. He explained that the majority of meetings of the Longwood Branch took the form of homestead meetings. Each member's homestead was visited in turn at different times of the year. Mr. Hughes also considered that it would be a good plan for members to visit neighboring Branches. A paper, "The Mis-uses of Manure," was then contributed by Mr. A. M. Elliott, of the Meadows Branch. The paper dealt principally with the average farmer's neglect to utilise to the fullest extent the manure that accumulated around the pigsties, stables, milking sheds, &c., when with a little expense provision could be made for its storage. A paper, "Mixed Farming; its Value to the State and its Needs," was read by Mr. J. R. Coles (Longwood). After explaining that he had been led to deal with the subject because of the urgent need for increased production, better distribution, expansion of oversea trade, and more population, Mr. Coles said the land in the Hills District was eminently suited to mixed farming and intense culture. Wattle, timber, fruits, nuts, vegetables, &c., could be grown, and pig raising,

poultry farming, and apiculture practised. With closer settlement there would be a large increase in population and practically every line of trade. The advancement of mixed farming and closer settlement was worthy of becoming the first ideal of Australia. Mr. H. Strange, of Cherry Gardens, then read a paper entitled "Vegetable Growing," in which he discussed methods of cultivating the principal vegetables grown in the Hills. At the instance of Mr. C. Ricks (Cherry Gardens), seconded by Mr. J. R. Coles (Longwood), it was decided to request the Advisory Board of Agriculture to endeavor to secure a reduction in the rail freight on perishable products. The next Conference is to take place at Balhannah in 1923.

3. CONFERENCE OF EYRE PENINSULA BRANCHES (MINNIPA.)

About 100 delegates from all parts of Eyre Peninsula attended the fourth Annual Conference of Eyre Peninsula Branches of the Agricultural Bureau held at the Government Experimental Farm, at Minnipa, on Thursday and Friday last. Many of those present travelled long distances and utilised means of transport ranging from saddle and pack horses to motors. They brought with them eatables and equipment to meet their requirements during their sojourn at Minnipa. In the absence of hotel accommodation, the spacious barn on the Government Farm was used for sleeping quarters.

The Department of Agriculture was represented by the Director of Agriculture (Professor Arthur J. Perkins), the Superintendent of Experimental Works (Mr. W. J. Spafford), the Horticultural Instructor (Mr. Geo. Quinn), Member of the Advisory Board (Mr. A. M. Dawkins), Assistant Government Veterinary Surgeon (Mr. R. F. McIndoe, M.R.C.V.S.), and the Secretary Advisory Board of Agriculture (Mr. H. J. Finnis). Throughout the proceedings the Chairman of the Minnipa Branch (Mr. G. Williams), presided. The opening address was delivered by Mr. A. M. Dawkins, who referred to the efforts of the Advisory Board to render assistance to the farming interests of the State generally, and instanced results that had accrued therefrom. He dealt with the mental equipment necessary for the successful farmer, particularly the need for an understanding of business principles and farm mechanics. The last-named he thought a matter that might receive greater attention in agricultural education in this State. After having paid a tribute to the services which the Government Veterinary Officers had rendered to stockowners throughout the State, he expressed his pleasure at having an opportunity of visiting the district and declaring the Conference open. The Director of Agriculture (Prof. Arthur J. Perkins), who welcomed the delegates to the farm for the fourth occasion, stated that, whereas originally he had doubted the likelihood of success of Conferences held on Government Farms, he was now convinced that the practice was most satisfactory. Among other matters to which the Director drew the attention of the gathering was the wisdom of making the surroundings of the farm

homestead as pleasant as possible for the young people raised on the farm as a means of counteracting other attractions. The Department was endeavoring to set an example at Minnipa, where an orchard had been planted, and olive and shade trees placed in suitable positions. As to the crop yields of the farm in question, he mentioned that on the average the cut of hay had been 1 ton 11cwt., the oat return, 31bush. 36lbs., barley, 16bush., and wheat, 20bush. These returns must be regarded as very satisfactory, but he was in hopes that they would be increased as years progressed. Wheat had been grown on bare fallow, on new land, and on stubble. For the past four (4) years the average yield bare fallow was 18½bush., on new land, 13½bush., and stubble, 11bush. Since 1917, in which year tests were instituted to determine the results likely to be secured from varying dressings of superphosphate, wheat on land unmanured had returned an average of 9bush. 51lbs. per acre; land dressed with ½ewt. of superphosphate yielded 14bush. 44lbs. per acre; 1ewt. super, 15bush. 22lbs.; 2ewt. super, 16bush. 30lbs.; 3ewt. super, 17bush. 30lbs. per acre.

The afternoon session was principally devoted to a number of questions submitted by Branches and replied to by the visiting officers, following which a paper entitled "Harvester versus Stripper" was read by Mr. J. McBeath (Talia) and discussed at length. In the evening, Mr. A. Palm (Edillilie) read a paper detailing his experiences with a farm tractor, and subsequently the Horticultural Instructor (Mr. Geo. Quinn) delivered an address in which he outlined the methods of preparing land prior to planting an orchard. The following morning was spent in a general tour of inspection of the Farm. The crops were generally, in the opinion of the delegates, far ahead of those in other parts of the Peninsula. Principal interest centred in the orchard, in which some of the trees are showing remarkable growth. Apricots, as an instance, four years from planting, were bearing very heavy crops, which gave very indication of maturing. A noticeable feature was the absence of any of the usual fungus pests which affect fruit trees. The Farm water supply, which is secured by impounding in a 670,000gall. concrete tank the rainfall caught on a granite outcrop known as the Yarwondutta Rocks, was the subject of no little admiration and envy. The water is directed from the rocks by means of reinforced concrete dwarf walls around the rock to the lower end where the tank has been built.

During the afternoon the Assistant Government Veterinary Surgeon (Mr. R. F. McIndoe, M.R.C.V.S.), performed major and minor veterinary operations for the instruction of delegates. In the evening a paper entitled "Sheep," contributed by Mr. P. Thompson (Talia), was read and discussed. Subsequently, the Conference devoted itself to Free Parliament, in the course of which it was decided to urge the installation of a pumping station at Polda and piping connecting the water supply there with the railway at McLachlan. It was also decided to ask that further investigation should be made into the mortality amongst sheep generally attributed to stinkwort poisoning; that a

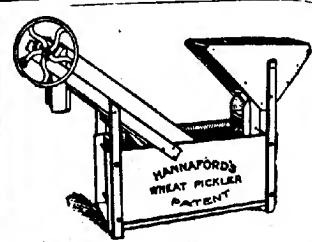
Government Veterinary Surgeon should be appointed to Eyre Peninsula; that the Manager of the Minnipa Experimental Farm should be provided with a motor car to enable him to visit neighboring Branches of the Agricultural Bureau as opportunity offered; and that it be made compulsory for wheat receiving agents to supply farmers with receipts showing the weight of individual bags of wheat delivered. It was also resolved to ask that railway facilities might be afforded farmers west of Minnipa to enable them to attend future Conferences, and that a sheep and wool expert should visit the district. It was determined that the Conference should meet again at the Minnipa Experimental Farm during the last week in September, 1923.

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THE AGRICULTURAL OUTLOOK.

REPORTS FOR MONTH OF OCTOBER.

The following reports on the Agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective Managers:—

Baoborowice.—Weather—The weather has been exceedingly dry and hot, chiefly during the first three weeks, and the last nine or ten days rather cold. A total of 70 points has been registered up to the time of writing. Crops—These are very good considering the dry spring that has prevailed, but, nevertheless, both hay and grain yields will be light for this particular locality. Natural feed is abundant. Stock are all in good healthy condition. Pests—Saffron thistle is again making its appearance. Rabbits are not nearly so numerous as is usually the case at this time of the year. Miscellaneous—Farmers are starting haycutting in many instances, and the crops will be on the light side, generally speaking.

Eyre Peninsula.—Weather—Hot winds have been prevalent and crops have suffered in consequence. Rain has fallen during three days, with a total for the month of 29 points. Crops looking well under the conditions, there only having been 8 in. of rain for the year and the majority of the crops are on new land. Haycutting is completed and carting is in full swing. Natural Feed—Very scanty, but with heavy rains the speargrass will come away. Stock—All in fair condition and free from disease. Miscellaneous—Farmers in the district are busy at water-carting, which is an enormous drawback to them, especially during harvest.

Kybybolite.—Weather—Has been very changeable. Good rains have fallen intermittently throughout the month, a half-inch being received practically each week. Altogether 272 points were recorded, which is 90 points above the average for the month. A heat wave was experienced on the 20th and 21st, but little or no damage was done by it. The total rainfall for the year was 17½ in., about 2 in. less than the average for the period during the last 16 years. Crops have made good growth during the month, and many are breaking into ear. Those growing on limed areas are looking particularly promising. Late-sown cereals on unlimed areas are very backward, and troubled by sorrel and other weed growths. Spring-sown crops—maize, turnips, kale, &c.—are germinating really well. Some pea crops are very promising. Natural feed is plentiful this month, there being a good growth of the smaller clovers on land that has received super dressings. Stock are mostly in good health. The wool clip is promising to be heavy, due, no doubt, to the good feed throughout the winter.

Turretfield.—The light rains that have fallen during this month have been of immense benefit to the crops, especially following the hot and drying conditions that prevailed during September; 154 points of rain have been registered, and the district could have easily done with another inch. Heavy dews and sharp frosts have been experienced during the latter part of the month. Crops are now running into head, and haymaking will be started shortly. The yield this year will be much lighter than last. Feed is fairly good, and in some places is drying off. Vines are making nice growth.

Veitch.—Weather—Have had 73 points of rain for the month; Veitch average for October, 109 points. Have experienced one of the roughest months on record with regard to wind. Crops generally have felt the effects of a dry finishing period, late-sown fields especially. Natural Feed—Enough natural feed is available to keep stock in good condition. Stock—All in healthy condition. Pests—Rabbits are very plentiful. Miscellaneous—Haycutting is in progress on most farms in the district.

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on November 1st, 1922:—

BUTTER.—Very favorable weather was experienced during the month of October, with the exception of two or three days of record high temperatures for this time of the year. Supplies have kept up remarkably well, and the local trade has been very heavy, but Western Australia has not been buying so freely, as she is just about self-supporting. However, all surplus has been forwarded to London, but buyers at the latter end of the month were chary in their operations, as it is expected that lower prices are likely to rule during December, so that values have eased somewhat during the month. First-grade to choicest factory and creamery fresh butter in bulk sold at 1s. 4d.; second-grade factory and creamery, 1s. 2d. to 1s. 3d.; best separators and dairies, 1s. 2½d. to 1s. 3½d.; fair quality, 1s. 1d. to 1s. 2d.; store and collectors', 11½d. to 12½d.

Eggs.—As the quality has been at its best, picklers and pulp manufacturers have been very busy in their operations, and good clearances have been effected, values maintaining fairly well. At close of the month fresh hen sold at 11s.; duck, 1s.

CHEESE.—South-Eastern factories are sending along heavy quantities of cheese, and, owing to the improvement in the London market, values here have advanced accordingly. Heavy business has been put through, and shipments are being made to London. This is helpful in reducing stocks that were accumulating somewhat. Prices at the end of the month were 8d. to 8½d. for large to loaf.

HONEY.—The first of the new season's has come forward, which is opening up very satisfactorily. Stocks of last season's are not heavy, so that good demand is likely to be experienced for the new season's take, best clear extra extracted selling at 3½d. to 4d.; second grade, 2d. to 2½d.; beeswax, 1s. 9d. for clear samples.

ALMONDS.—Supplies are very short, most of the last season's crop being practically cleared. Any consignments coming forward are meeting with speedy quittance, Brandis selling at 13½d.; mixed softshells, 12d. to 12½d.; hardshells, 6d. to 6½d.; kernels, 1s. 9d.

BACon.—Values throughout the month have been stationary, the quantities coming forward being quite equal to trade requirements. Good demand has been experienced for sides and middles, and hams are showing a marked improvement in price, buyers operating keenly in anticipation of Christmas requirements. Best factory-cured sides, 13d. to 14d.; middles, 1s. 3d.; rolls, 11½d.; hams, 1s. 6d. Lard, in packets, 8d.; in bulk, 7½d.

LIVE POULTRY.—Purchasers have been in full attendance at our three auctions weekly—Tuesday, Thursday, and Friday—and very keen competition has been experienced, as buyers are now operating and putting away in cold store for Christmas trade, prices ruling in some lines being record ones, and farmers would be wise if they send on now instead of waiting till later, so as to participate in the excellent prices that are now ruling; crates obtainable on application. Rates:—Prime roosters, worth 6s. to 7s. 3d.; nice-conditioned cockerels, 4s. to 5s. 6d.; plump hens, 4s. 3d. to 5s. 3d.; medium hens, 3s. 4d. to 4s.; ducks, prime condition, 5s. to 6s.; fair condition, 3s. 3d. to 4s. 3d.; geese, up to 6s. 9d.; turkeys, prime condition, 1s. 5d. to 1s. 6½d. per lb. live weight; fair condition, 1s. 1d. to 1s. 3½d. per lb.; pigeons, 8d. to 9d.

POTATOES.—Values have come back during the month for old potatoes, as was to be expected owing to the prices in Victoria being lower, and as new potatoes are now arriving more freely many buyers are operating for these. Values at the close of the month were:—Best factories, 9s. to 10s. per cwt. on trucks Mile End; new local grown potatoes, 17s. to 20s. per cwt. There are also fair quantities of new potatoes arriving shortly from Western Australia.

ONIONS.—Values in these also have eased considerably, but the sale of old onions has now finished. Values at the end of the month were 15s. to 17s. 9d. per cwt. for old; new Whiteskin, at 16s. to 18s. per cwt. on trucks.

RAINFALL TABLE.

following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of October, 1922, also the average rainfall to the end of September, and the average annual rainfall.

Station.	For Oct., 1922.	To end Oct., 1922.	Avg. to end Oct., 1922.	Avg. Annual Rainfall	Station.	For Oct., 1922.	To end Oct., 1922.	Avg. to end Oct., 1922.	Avg. Annual Rainfall					
FAR NORTH AND UPPER NORTH.														
Indatta	0.39	4.25	4.01	4.83	Spalding	0.71	14.90	17.77	20.33					
ee	0.11	2.37	4.98	6.10	Gulnare	1.07	17.01	16.96	19.23					
ee	0.18	3.41	5.72	6.73	Yacka	0.87	14.03	13.67	15.34					
ee	0.15	3.19	7.11	8.45	Koolunga	0.60	13.47	12.90	15.79					
ee	0.25	4.59	7.42	9.01	Snowtown	1.23	14.05	14.46	15.95					
ma	0.30	6.41	10.77	12.62	Brinkworth	0.68	13.85	15.23	16.16					
man	—	2.63	5.81	7.59	Blyth	1.19	16.89	15.09	16.75					
cola	0.26	10.10	11.18	13.30	Clare	1.39	25.54	22.13	24.51					
king	0.23	11.12	10.94	12.72	Mintaro	1.53	25.65	25.99	23.26					
ker	0.37	10.45	10.69	12.33	Watervale	1.24	27.58	22.66	27.41					
on	0.20	8.23	9.65	11.05	Auburn	1.24	23.65	21.81	24.25					
on	0.42	9.12	11.95	14.00	Hoyleton	0.92	17.66	16.80	17.79					
Augusta	0.36	8.30	8.34	9.54	Balaklava	0.79	15.18	14.02	15.87					
Augusta West	0.31	7.48	8.39	9.53	Port Wakefield	0.84	11.14	11.90	13.19					
o	0.13	7.65	9.04	10.40	Terowie	0.64	11.89	11.71	13.67					
mond	0.48	9.50	10.18	11.61	Yarcowie	0.43	13.85	12.31	14.06					
ington	0.71	15.21	16.27	18.17	Hallett	0.96	13.31	14.33	16.37					
owie	0.51	12.71	10.64	12.16	Mount Bryan	0.70	14.11	14.54	16.54					
ee	1.22	22.44	20.97	23.21	Kooringa	1.01	17.98	16.11	17.96					
ero Centre	0.53	13.37	13.58	15.53	Farrell's Flat	0.88	17.34	16.95	18.90					
Germein	1.04	10.95	11.07	12.79	WEST OF MURRAY RANGE.									
barra	0.80	14.17	17.57	19.62	Manoora	1.40	20.38	19.20	18.63					
ta	0.63	12.09	14.01	14.98	Saddleworth	1.44	18.88	17.52	19.70					
ock	0.31	3.75	9.80	11.18	Marrabel	1.94	21.49	17.29	19.55					
eton	0.29	10.10	10.97	12.63	Riverton	1.64	21.75	18.46	20.66					
burg	0.29	10.52	10.07	10.50	Tarlee	1.40	20.34	15.72	17.75					
ta	0.23	10.12	11.37	13.36	Stockport	1.50	18.11	14.41	16.34					
oo	0.33	10.74	11.19	13.57	Hamley Bridge	1.33	16.29	14.50	16.45					
ara	0.21	11.52	10.06	11.33	Kapunda	2.14	19.54	17.69	19.80					
Rock	0.24	10.67	10.79	12.61	Freeling	1.60	18.51	15.79	17.82					
ta	—	—	10.37	11.90	Greenock	2.27	21.51	18.09	21.56					
rborough	0.33	10.72	12.81	13.43	Truro	1.78	18.75	17.98	20.07					
ala	0.51	12.72	12.43	14.41	Stockwell	1.52	18.72	16.93	20.24					
LOWER NORTH-EAST.														
ta	0.41	5.33	7.41	8.75	Nuriootpa	1.73	18.98	18.61	20.94					
karina	0.19	4.06	8.41	8.41	Angaston	1.61	21.44	19.96	22.44					
ahill	0.26	2.89	7.20	8.54	Tanunda	1.63	20.60	19.91	22.17					
burn	0.19	4.30	8.48	8.22	Lyndoch	1.97	20.77	20.57	22.81					
Ten Hill, N.S.W.	0.31	5.76	—	9.91	Williamstown	1.85	23.42	24.91	27.52					
LOWER NORTH.														
Pirie	1.08	12.54	11.83	13.36	ADELAIDE PLAINS.									
Broughton	1.04	13.16	12.72	14.18	Mallala	1.23	15.93	14.84	16.56					
ta	1.11	12.33	14.41	15.65	Roseworthy	1.86	16.00	15.33	17.27					
ta	1.45	17.04	16.18	18.16	Gawler	1.41	15.85	17.10	19.08					
rie	1.27	16.66	15.04	17.07	Two Wells	1.15	13.34	14.17	16.85					
etown	1.14	17.35	15.58	17.74	Virginia	1.31	13.59	15.42	17.32					
aleer W. Wks.	1.01	16.61	15.78	17.89	Smithfield	1.00	12.93	15.12	17.15					
stone	1.16	17.08	14.19	16.13	Salisbury	1.66	17.73	16.53	18.49					
al Brook	0.78	14.09	14.04	15.74	North Adelaide	2.09	23.84	19.90	22.09					
etown	0.71	19.02	17.40	18.44	Adelaide	1.70	20.14	18.90	21.03					
dy	0.62	12.10	14.56	16.41	Glenelg	1.70	18.43	16.50	18.37					
ill	0.86	15.22	15.11	16.75	Brighton	1.84	18.75	18.49	21.24					
					Mitcham	2.23	28.65	21.78	23.92					
					Glen Osmond	2.50	28.09	23.34	26.74					
					Magill	2.31	24.92	22.65	25.27					

RAINFALL—continued.

Station.	For Oct., 1922.	To end Oct., 1922.	Avg. to end Oct., 1922.	Avg. Annual rainfall	Station.	For Oct., 1922.	To end Oct., 1922.	Avg. to end Oct., 1922.	Avg. Annual rainfall
MOUNT LOFTY RANGES.									
Teatree Gully	2-42	23-81	25-73	27-77	Port Lincoln	0-34	14-59	18-18	18-18
Stirling West	4-88	50-37	41-58	46-62	Tumby	0-59	9-89	12-98	14-14
Uraidla	4-37	47-97	40-14	44-06	Carrow	0-56	8-29	12-71	14-14
Clarendon	3-21	34-77	30-01	32-98	Arno Bay	0-38	6-57	11-83	13-13
Morphett Vale	2-54	24-26	20-46	22-76	Cowell	0-41	6-21	9-40	10-10
Noarlunga	2-10	20-60	18-48	20-27	Point Lowly	0-56	9-22	—	—
Willunga	2-52	28-59	22-68	25-87	WEST OF SPENCER'S GULF—continued.				
Aldinga	1-47	20-70	17-44	20-24	Wallaroo	0-86	10-06	12-83	14-14
Myponga	2-45	31-76	26-26	28-44	Kadina	0-83	11-80	14-70	15-15
Normanville	2-16	24-08	16-94	20-51	Moonta	0-80	11-00	14-94	15-15
Yankalilla	2-35	27-36	21-08	22-99	Green's Plains	1-06	12-30	14-45	15-15
Mount Pleasant	2-30	27-95	24-80	27-04	Maitland	1-42	15-61	18-32	19-19
Birdwood	2-03	25-88	26-75	29-26	Adrossan	2-06	14-06	12-78	13-13
Gumeracha	2-74	30-81	30-24	33-25	Port Victoria	1-10	14-03	14-01	15-15
Millbrook Reservoir	2-65	39-31	—	—	Curramulka	1-60	14-59	16-71	17-17
Tweedvale	3-07	31-11	32-50	35-54	Minlaton	1-60	15-06	16-87	17-17
Woodside	2-97	30-92	29-33	32-08	Brentwood	1-41	13-68	14-17	15-15
Ambleside	3-08	34-29	31-63	34-62	Stansbury	1-30	13-80	15-58	16-16
Nairne	2-87	26-23	25-84	28-43	Warooka	0-97	17-03	16-43	17-17
Mount Barker	3-07	32-62	28-44	31-13	Yorketown	1-13	14-72	18-77	19-19
Echunga	3-05	32-97	30-11	32-91	Edithburgh	1-20	14-24	14-93	15-15
Macclesfield	3-14	30-05	27-88	30-53	YORKE PENINSULA.				
Meadows	3-34	36-30	32-75	36-04	WEST OF SPENCER'S GULF—continued.				
Strathalbyn	1-85	18-70	17-43	19-26	Wallaroo	0-86	10-06	12-83	14-14
MURRAY FLATE AND VALLEY.									
Meningie	2-10	14-75	15-75	18-66	Kadina	0-83	11-80	14-70	15-15
Milang	1-53	15-19	13-76	15-42	Moonta	0-80	11-00	14-94	15-15
Langhorne's Creek	1-54	11-24	12-84	14-55	Green's Plains	1-06	12-30	14-45	15-15
Wellington	1-55	13-95	12-84	14-68	Maitland	1-42	15-61	18-32	19-19
Taiham Bend	1-52	14-19	12-58	14-11	Adrossan	2-06	14-06	12-78	13-13
Murray Bridge	1-75	12-83	12-18	13-83	Port Victoria	1-10	14-03	14-01	15-15
Callington	1-72	15-43	13-95	15-37	Curramulka	1-60	14-59	16-71	17-17
Mannum	0-86	10-79	10-32	11-52	Minlaton	1-60	15-06	16-87	17-17
Palmer	1-17	12-39	13-61	15-24	Goolwa	1-92	15-77	16-59	17-17
Sedan	0-92	10-17	10-91	12-13	Meribah	0-98	10-67	—	—
Swan Reach	0-83	8-76	9-41	10-82	Mindarie	0-99	8-39	—	—
Blanchetown	0-56	5-21	10-78	10-16	Karoonda	1-54	14-93	—	—
Eudunda	0-90	14-51	14-81	17-50	Pinnaroo	1-51	11-56	13-59	14-14
Sutherlands	0-51	9-95	9-51	10-92	Parilla	1-52	12-36	12-62	13-13
Morgan	0-54	8-03	7-83	9-18	Lameroo	1-84	13-16	13-14	14-14
Waikerie	0-48	7-50	8-10	9-68	Parrakie	1-37	12-65	12-57	13-13
Overland Corner	0-26	7-22	9-34	11-08	Geranium	2-08	19-15	14-13	15-15
Loxton	0-77	11-01	10-57	12-58	Peake	2-16	16-32	13-29	14-14
Renmark	0-65	9-59	9-25	11-02	Cooke's Plains	1-87	16-31	13-28	14-14
WEST OF SPENCER'S GULF.									
Eucla	0-12	8-05	8-88	10-02	Coomandook	1-73	15-87	15-46	16-16
White Well	0-30	9-98	7-83	9-10	Coonalpyn	1-65	14-99	15-45	16-16
Fowler's Bay	0-33	9-66	11-26	12-19	Tintinara	2-64	18-98	16-24	17-17
Penong	0-12	10-68	11-43	12-25	Keith	2-19	18-12	16-76	17-17
Ceduna	0-28	6-54	9-09	10-32	Bordertown	2-05	14-91	17-08	18-18
Smoky Bay	0-14	9-35	10-33	10-92	Wolseley	2-25	15-52	16-05	17-17
Petina	0-34	—	11-73	13-05	Frances	1-96	15-95	—	—
Streaky Bay	0-10	11-56	13-76	15-11	Naracoorte	3-57	22-22	20-00	21-21
Talia	0-17	10-60	13-94	15-38	Penola	2-50	21-28	23-41	24-24
Port Elliotson	0-36	15-18	15-37	16-53	Lucindale	2-80	21-48	20-61	21-21
Cummins	0-17	12-84	—	18-87	Kingston	1-87	25-03	22-07	23-23
					Robe	1-57	28-16	22-30	23-23
					Beachport	1-80	24-23	24-92	25-25
					Millicent	2-39	28-24	26-62	27-27
					Kalangadoo	3-19	27-74	—	—
					Mount Gambier	2-34	24-27	27-79	28-28

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings		Branch.	Report on Page	Dates of Meetings.	
		Nov.	Dec.			Nov.	Dec.
Alawoona	*	—	—	Georgetown	376	4	2
Aldinga	*	—	—	Geranium	391	25	—
Amyton	*	6	4	Gladstone	370	3	1
Angaston	*	—	—	Glencoe	*	—	—
Appila-Yarrowie	*	—	—	Glossop	*	—	—
Arthurton	381	—	—	Goode	*	8	6
Ashbourne	394	—	—	Green Patch	383	6	4
Balaklava	*	11	9	Gumeracha	*	6	4
Balhannah	394	3	1	Halidon	391	—	—
Barnera	†	7	6	Hartley	392	1	6
Beetaloo Valley	368	—	—	Hawker	*	7	—
Belalie North	*	4	2	Hilltown	*	—	—
Berri	*	8	—	Hookina	365	6	4
Big Swamp	*	—	—	Inman Valley	*	—	—
Blackheath	391	4	2	Ironbank	*	4	2
Black Springs	†	7	5	Julia	*	—	—
Blackwood	394	20	18	Kadina	*	—	—
Block E	†	—	—	Kalangadoo	396	11	9
Blyth	†	4	2	Kangarilla	*	—	—
Booleroo Centre	*	3	1	Kannmantoo	*	4	2
Borrika	*	—	—	Keith	*	—	—
Bowhill	*	—	—	Ki Ki	*	—	—
Brentwood	380	2, 30	—	Kilkerran	380-1	30	—
Brinkley	391	4	2	Kimba	*	—	—
Bundaleer Springs	*	—	—	Kingscote	*	—	—
Burns	*	—	—	Kingston-on-Murray	*	—	—
Bute	*	28	—	Kongorong	396	2	7
Butler	382	—	—	Koonibba	*	3	1
Cadell	*	—	—	Koppio	389	6	4
Canowie Belt	*	—	—	Kybybolite	†	2, 30	—
Carrow	382	2	—	Lake Wangary	390	—	2
Cherry Gardens	394	30	—	Lameroo	391	3	1
Clanfield	*	—	—	Laure	†	4	2
Clare	379	—	—	Leighton	*	—	—
Clarendon	394	30	4	Lenswood and Forest Range	394	27	—
Claypan Bon	391	8	6	Lone Gum and Monash	391	8	6
Cleve	†	1, 29	—	Lone Pine	*	—	—
Collie	389	—	—	Longwood	392	4	9
Colton	*	24	—	Loxton	†	—	—
Coomandook	*	1, 29	—	Lucindale	*	—	—
Coonalpyn	*	3	1	Lyndoch	379	—	—
Coorabie	*	4	2	McLachlan	390	—	—
Cradock	*	—	—	Maitland	381	2, 30	—
Crystal Brook	*	4	—	Mallala	*	6	4
Cygnet River	*	2, 30	—	Maltee	390	3	1
Dawson	*	—	—	Mangalo	*	—	—
Denial Bay	*	—	—	Marama	*	9	—
Edillillie	382	25	—	Meadows	†	8	6
Elbow Hill	389	7	5	Meningie	*	—	—
Eureka	365	10	—	Milang	†	11	9
Frances	*	25	—	Millicent	†	4	2
Freealing	*	—	—	Miltalie	390	4	2
Gawler River	377	6	5				

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Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Nov.	Dec.			Nov.	Dec.
Mindarie	•	6	4	Riverton (Women's)	*	—	—
Mirliton	•	3	1	Roberts and Verran	386	2	R
Minnipa	390	1	—	Rockwood	393	6	4
Mintaro	•	—	—	Rosedale	380	—	—
Monarto South	390	4	—	Roey Pine	*	—	—
Moonta	381	3	1	Saddleworth	*	—	—
Moorak	396	2, 30	—	Saddleworth (Women's)	†	—	—
Moorlands	•	—	—	Salisbury	380	7	5
Moorook	•	—	—	Salt Creek	*	—	—
Morehard	366	4	2	Sandalwood	•	—	—
Morgan	•	—	—	Second Valley	*	—	—
Morphett Vale	•	2	7	Shoal Bay	•	28	—
Mount Barker	•	1, 29	—	Smoky Bay	390	4	2
Mount Bryan	•	—	—	Spalding	•	—	—
Mount Bryan East	•	—	—	Stockport	378	—	—
Mount Compass	•	—	—	Streaky Bay	†	—	—
Mount Gambier	•	11	9	Strathalbyn	†	7	—
Mount Hope	386	4	2	Talia	386	13	11
Mount Pleasant	395	—	—	Tantanoola	•	4	2
Mount Remarkable	†	—	—	Toplarn	•	11	9
Mundalla	•	1, 29	—	Tarcowie	368	7	—
Murray Bridge	•	21	—	Tarlee	380	—	—
Mypolonga	•	1, 29	—	Tatiara	396	18	16
Myponga	•	—	—	Two Wells	†	—	—
Nantawarra	380	2, 30	—	Uraidla & Summertown	394	6	4
Naracoorte	395	11	4	Veitch	•	—	—
Narryd	*	4	2	Virginia	•	—	—
Narrung	•	4	2	Waikerie	391	—	—
Neeta	•	—	—	Wall	*	—	—
Nelshaby	†	—	2	Wanbi	*	—	—
Netherton	391	—	—	Warcowie	†	—	—
North Booborowie	370	—	—	Watervale	380	—	—
North Bundaleer	•	—	—	Weavers	381	6	4
Northfield	•	8	13	White-Yarcowie	374	—	—
Nunkeri and Yurgo	•	5	3	Wilkawatt	391	4	2
O'Loughlin	•	1, 29	—	Williamstown (Women's)	380	1	4
Orroroo	366, 368	—	—	Williamstown	378	3	1
Owen	377	3	1	Willow	†	1, 29	—
Parilla	391	—	—	Wilmington	•	1, 29	—
Parilla Well	391	6	4	Windsor	390	—	—
Parrakie	*	—	—	Winkie	*	—	—
Paruna	•	—	—	Wirrabora	376	4	2
Paskeville	†	28	R	Wirrega	*	—	—
Pata	•	—	—	Wirilla	*	4	2
Penola	396	4	2	Wolova	*	—	—
Fetina	390	25	—	Wudinna	*	4	—
Pinaroo	†	3	1	Wynarka	*	4	—
Pompoota	•	8	13	Yabmana	*	—	—
Port Broughton	*	3	1	Yacks	*	7	—
Port Elliot	*	18	16	Yadnarie	388	28	—
Port Germein	*	4	—	Yallunda	*	—	—
Pygery	†	—	—	Yaninnee	*	—	—
Ramco	•	6	4	Yeelanna	388	4	—
Rapid Bay	392	4	2	Yongala Vale	*	—	—
Redhill	372	—	—	Yorketown	*	—	—
Rendelsham	396	1, 29	—	Youngusband	†	2	7
Renmark	†	2, 30	—				
Riverton	•	—	—				

* No report received during the month of September.

R In recess.

† Held over until next month.

‡ Formal.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

EURELIA.

September 8th.—Present: seven members.

HORSE BREAKING.—In the course of a short paper on this subject Mr. M. J. Cahill said he preferred to handle the young horse when it was about three years old. To make a thorough job of the work, it was necessary to exercise patience and common sense. Kindness was also essential. The colt should be run into a small yard and tied up with a strong rope. To mouth the animal, a small rope should be placed around its neck and passed through the near side bit ring. After the colt had been run around the yard for awhile with the rope in that position it could be changed to the off-side. Next the colt should be attached to a log and taught to pull by being driven first one way and then the other. After it had become used to the feel of the chains it could be put in the team between two quiet horses. In order that the colt's shoulders would have a chance to harden, it was not advisable to work the animal too long at a time during the first week. If the young horse was working on a swing he should be allowed a little advantage over the older horses, for if the work was at all rough the colt would not be so likely to have its shoulders injured by the jarring of the machine. He thought it best to work the colt behind a good leader in the wagon team. If the animal did not take too kindly to the work it should be placed in the shafts, where it would soon quieten down.

HOOKINA (Average annual rainfall, 12in.).

August 31st.—Present: 10 members.

SHEEP.—Mr. A. J. Henschke, who contributed a paper on this subject, said the breed of sheep best suited to the conditions of the Hookina district was the pure-bred Merino, preferably one fairly free from wrinkles. He considered that a ewe with a fairly straight neck, a good frame, and carrying a good fleece of wool would give an ideal lamb if mated with a ram that had a body free from wrinkles, and about three folds of "leather" on the neck. Important points in the management of the flock were the age and sex and the earmarks and brands. If a certain form of earmark was used, say, on the right ear for ewes and the left ear for wethers, the drafting of the sheep in the race would be very much simplified. By using a special mark, and changing its position on the sheep's body each year, the farmer would be able to tell the age of the sheep without having to look at its mouth. Again, by using a number for a brand a good deal of trouble could be avoided. For instance, the breeding ewes should be branded in one position, the culs in another, and hoggets in another, &c., so that if one desired to draft the flock at any time it would not present any difficulties. Culling was an important point in the successful management of the flock. The speaker did not think it advisable to keep wethers after they became "full-mouthed." If an ewe was old, yet still a good breeder and a desirable type of animal, it was better to continue breeding from her rather than to use a young and inferior ewe. For the classing of small

clips of wool, the writer was of the opinion that the most simple plan to adopt was to draft the sheep into different lots before bringing them into the shearing shed. After the farmer had decided on the various classes, the fleece, on being taken from the sheep, should be skirted, and the pieces classed in a similar manner to the fleeces. In the discussion that followed, Mr. B. Murphy said he made a practice of selling the wethers when "four-toothed," and he did not think it advisable to take very much trouble with the classing of the clip unless the farmer had at least from 500 to 600 sheep. Mr. H. Henschke referred to the necessity for watching the sheep during the time when blowflies were troublesome. Mr. J. Murphy favored the plan of marketing wether lambs. Mr. T. Patterson, of the Williamstown Branch, and Mr. R. Wardleworth each referred to the importance of crutching the sheep, to minimise the danger of attack from flies. [Any owner of a registered sheep brand has the right to use any of the numerals from 2 to 9 in any color paint on any position as a distinctive brand on his sheep, provided that only one of such numerals must be placed on a sheep. Numerals must not exceed 4 in. in size or height. The owner of a registered sheep brand may mark his sheep with any earmark he chooses, and may also attach tags to the backs of the ears of sheep. All sheep earmarks must be made with pliers, and must not exceed $\frac{1}{2}$ in. by $\frac{1}{2}$ in. in size. The ears must not be cut or cropped off by a straight cut.—Ed.]

MORCHARD (Average annual rainfall, 13.50in.).

September 2nd.—Present: 14 members and two visitors.

CARE OF HORSES' TEETH.—A paper on this subject was read by Mr. H. Toop, who stated that, no matter how well the horse was fed, nutrient would be wasted if the animal had defective teeth. No expert knowledge was required to tell if the horse's teeth were bad. One of the easiest ways of detecting faulty teeth was to watch the droppings of the animal. If the manure contained numerous pieces of whole or partly undigested food, one could be fairly certain that the teeth were out of order. Another sign of bad teeth was an excessive discharge of saliva from the mouth. If either of the above signs were observed the owner should at once seek to ascertain the cause of the trouble, which could usually be located by an inspection of the mouth with the aid of a gag. A gag was a fairly expensive instrument, and he suggested that several farmers should club together and purchase one. One of the most common defects found in the mouth of the horse was a long tooth or a sharp spike that had cut into the side of the animal's cheek. With a proper tooth file the farmer could level the tooth down without much trouble. Assistance in holding the horse would very likely be required, and if the animal was restless it would be necessary to place a twitch on its nose. If any loose teeth were located they should be removed with a pair of forceps. The speaker said he was not in favor of feeding very finely cut chaff to the horses, and suggested giving the animals at least one feed of long hay each day.

ORROROO (Average annual rainfall, 13.42in.).

September 2nd.—Present: nine members.

FARM MANAGEMENT.—Mr. A. L. Brice, who read a paper dealing with this subject, said good management was a most essential factor in the success of any occupation. From the appearance of some farms it was easily seen that the man in charge managed his affairs in a proper manner, while other farms gave an observer just a reverse opinion. He considered that it would be a good plan if the farmer was to map out over night the work that he had to perform on the next day, so that he could set about his duties in the most expeditious manner. Another good plan was for the farmer to carry a small notebook and mark down anything that required attention. An important item in the management of the farm was to see that the gates and fences were kept in good order. If that was done the farmer would lose no time in looking for the stock, neither would there be any anxiety as to their whereabouts. Provision should be made for a permanent water supply, and the implements should not be left out in the open when not in use. Overstocking could frequently be attributed to the mismanagement of the holding, whilst almost the same could be said of the understocked farm.

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TARCOOWIE (Average annual rainfall, about 15½ in.).

September 5th.—Present: 15 members and three visitors.

THE PETROL MOTOR AS USED IN CARS AND FARM ENGINES.—In the course of a paper dealing with this subject Mr. H. Hortin first referred to the strides that had been made in the development of the petrol motor and the extent to which it had become popular among those engaged in rural occupations. The following hints, he said, might prove useful in solving some of the engine troubles that from time to time confront the motorist:—Most carburettor trouble is developed through the absence of an effective strainer or filter when you supply the tank with petrol from the ordinary tin. Dirt or water are the guilty factors; either of these, when passing through the nozzle or jet, being heavier than petrol, lodge on the jet, and thus cause the trouble. It has been said that 50 per cent. of carburettor trouble is caused by road dust that enters through the air valve. When firing ceases or becomes irregular it must not be presumed that the carburettor adjustments are bad or that some other defect is interfering with the proper supply of mixture to the cylinder. To find the fault, first unscrew the plug from the combustion chamber and lay it on the engine-frame to ensure the usual earth connections. Then manipulate the contact-maker until the platinum points meet centrally together and watch the plug to see if a good spark occurs. If so, it is improbable that the plug is to blame; if, on the other hand, the spark is poor or no spark at all, the fault must be somewhere else in the ignition apparatus. If the accumulator is nearly exhausted, which can be seen by the use of a voltmeter, set the points of the plug closer together and get the accumulator charged as soon as possible. On the other hand, if it is fully charged and no spark at the plug, unfasten the high tension wire from the plug and hold its end near some bare metal of the motor and work the commutator. If no spark results, examine the various terminals, as they may have worked loose. This should bring the trouble to a conclusion unless some other source is using the current, by the coating having been worn off and the wires touching some other metal of the engine. Always keep the platinum tips clean and free from oil. Those who have an electric lighting and starting set should pay great care to the batteries. Batteries are exhausted more rapidly than is often necessary. For instance, take a car that has been standing for a few days. The thoughtless driver switches on the starter, which results in an excessive use of current. If the ammeter and voltmeter were put into practice, more battery current would be conserved. Sometimes it is lost altogether through the amperage getting too low, and then the plates sulphate, and so ends the life of a most important part of the motor. Tires.—Always keep the wheel in perfect alignment. This keeps the tires on the wheel longer than if the alignment is lost. A deflated tire will not give a good mileage and will ruin the tube. Do not always rely on the pressure gauge, but inflate the tires until they just begin to bulge on the tread under full load. Keep them as much as possible from heat and sunlight, as these both have a detrimental effect on rubber.

ORROROO, September 30th.—The delegates of the Branch who attended the Annual Congress gave a detailed report of the proceedings of the various sessions, and an interesting discussion followed.

TARCOOWIE, October 3rd.—Mr. Thomas gave an interesting report of the proceedings of the various sessions of the Annual Congress.

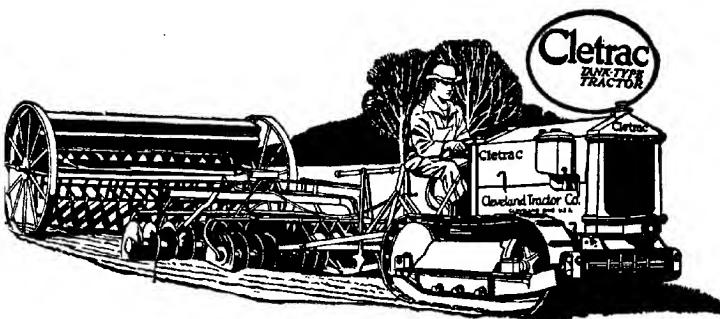
MIDDLE-NORTH DISTRICT.**(PETERBOROUGH TO FARRELL'S FLAT.)****BEETALOO VALLEY** (Average annual rainfall, 23.50 in.).

September 4th.—Present: 14 members and visitors.

DESTRUCTION OF VERMIN.—In the course of a paper dealing with this subject Mr. J. McIntosh first advised all owners of land infested with rabbits to enclose the property with wire netting, and if funds were available to subdivide and erect

small netting yards in the corners of the paddocks. The vermin could then be cleared out by fumigating and filling in the holes and by using wire-netting traps. The latter he had found cheaper and more effective than the steel traps. In protecting the haystacks from the ravages of rats and mice, he suggested the placing of pieces of galvanized iron 3ft. from the ground and about 18in. in the ground, and the laying down of a concrete floor. Where the stock were troubled with wild dogs he suggested that the owners should form themselves into a society and engage an experienced man to poison or trap. He was of the opinion that the district councils should attend to all these matters, and pay the rangers accordingly, as the pests affected everyone in the district.

FILLING GUTTERS ON FARMS AND ORCHARDS.—Mr. W. T. Petrie, who read a paper on this subject, said, generally speaking, farmers allowed gutters to become too deep before making any attempt to fill them in, which made the working of the land very unpleasant. Some farmers favored filling them in with stones, but he had noticed that heavy rains soon washed them out, and they then became a trouble somewhere else on the farm. Stone, when picked up from the land, could be used with straw to fill gutters to prevent washing away. The blocks would have to be placed at a reasonable distance apart to allow the gutters to silt up. On hillsides it was a difficult matter to keep the land from washing out. Care should be taken when working the land not to finish the cultivating so that the tine marks led the water downhill. Boughs, if procurable, were good for filling gutters, as they rarely washed out. If a cover crop was grown in the orchards very little washing out would be experienced during the growing period. On hillsides it was a good plan to have drains on the high sides to carry flood waters away. That prevented the land from washing out, and saved a lot of time in filling gutters. In the event of gutters occurring in the orchards, prunings could be used with advan-



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tage if carefully placed lengthways in the gutters, but care had to be taken when crossing the fillings to ease the cultivator out of the ground in order not to pull out the prunings until a coat of earth covered them. Should the orchardist not be able to carry the flood waters off it was advisable to make provision and open a drain across the orchard, and convert all water into it, thereby saving the formation of numerous gutters. In all probability overhead crossings would have to be made over the drain for convenience of working and gathering fruit. Bags filled with earth would be useful in helping gutters to silt up in orchards, and these would not be likely to wash out.

GLADSTONE (Average annual rainfall, 16in.).

September 8th.—Present: 12 members and nine visitors.

THE VALUE OF STABLE MANURE.—The monthly meeting of the Branch was held at Mr. G. M. Black's residence, when a paper dealing with the above subject was read by Mr. A. B. Blesing. The speaker expressed surprise at the fact that in the majority of districts not sufficient value was placed on stable manure. In a district favored with a reasonable rainfall the manure was capable of producing an excellent growth of feed. If the stable manure was spread evenly over a small paddock, the land broken up and sown early with barley, an excellent grazing crop would be produced. Later on the paddock could be closed up and the crop cut for hay. He had grown a small paddock of barley continuously for seven years, and it was surprising the amount of feed that it had yielded. The speaker referred to a paddock that had been partly dressed with stable manure and part with super during the past year. The portion that had been dressed with stable manure produced a crop that at the present time stood 2ft. high, while the crop on the land that had been treated with super was only 8in. high. Red patches of land and light soils would produce a heavier crop if stable manure was distributed over the land with the aid of a cultivator. The speaker also stated that he had found stable manure an excellent remedy for blocking up gutters that had been washed out of the land. In the discussion that followed Mr. J. H. Sargent stated that stable manure gave better returns from a barley crop than a dressing of 60lbs. to 80lbs. of super. Mr. Bergin said an application of stable manure to a piece of land had enabled him to grow a very fine crop of onions. The land previously would not produce any green crops. In reply to a question regarding the application of the manure to the land, Mr. Blesing said the best practice was to cart the manure direct from the stables and spread it over the land. Mr. Blesing also stated that when the manure was applied to fruit trees it should be dug into the soil. Supper was provided by Mrs. Black, and a very pleasant social evening was concluded with a vote of thanks to the host and hostess.

NORTH BOOBOROWIE (Average annual rainfall, 16.35in.).

September 5th.—Present: seven members.

HAND MILKING v. MILKING MACHINES.—Mr. J. Dawson, in a paper supporting the machine for milking, said the first item that had to be considered was that of the expense in purchasing the necessary equipment and the installation of the milking plant. A first-class shed and milking machine, he considered, could be erected and purchased for about £230, which would be all the outlay that would be required, apart from the running expenses of the machine, for many years to come. With a herd of 40 cows the speaker considered that the work could be performed by three persons. In addition to the time saved in the milking of the cows the dairyman was able to separate whilst milking was in operation. Where the machines were used there were not so many utensils to keep clean, and with the most modern outfits the milk was taken straight from the cow to the bowl of the separator. He also considered that where the machines were installed there was very little difficulty experienced in securing labor, but that could not be said of those places where hand milking was still in vogue. With the assistance of two lads, the dairyman could cope with a fairly large herd of cows, and, as was natural with most boys, they were glad to have the opportunity of manipulating

an engine. Again, one could not but help notice how the most restless cow in the herd would offer no objection to having the cups placed on her teats, and would stand quietly and contentedly through the whole of the milking. During the busy seasons of the year the whole of the dairying work could be left in the hands of the women, who would find no trouble in getting used to the machinery. He was convinced that a man who intended starting dairying could not do better than instal a mechanical milker. Mr. F. Giles, who spoke in favor of hand milking, was of the opinion that at the present-day prices for dairy produce, hand milking was the best and most satisfactory proposition. He agreed that two years ago the installation of a power plant was a good investment, because a very good price could be obtained for butter, pork, &c., and because of the difficulty in securing labor. But at the present time one could not obtain such high prices for dairy produce, and there was no great difficulty in securing good labor. Added to those one had to consider the high price of the machines and the cost of oil, repairs, &c. Taking a dairyman with two lads to help milk a herd of 24 cows, the speaker contended that the milking and separating could be completed within an hour and a half. The wages for the extra lad would be 25s. per week. The parts, oil, and benzine for the engine would take about 10s. per week, and with interest on the cost of machine and shed would amount to about 19s. 3d. per week. The extra lad would be able to help in the work of the farm between the morning and evening milking, which would more than pay for the extra 5s. 9d. per week. Again, one had to take into consideration the time lost in overhauling and repairing the engine. He had noticed that by exerting a little pressure on the

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claws of the cups of the machine that the cows could be milked out more cleanly, but it had a tendency to make the cow lose the use of one quarter. In concluding, the speaker said out of five milking plants that were installed in their district he knew of three that were on the market for sale. Mr. R. Dawson, who also read a paper in support of hand milking, said a complete milking plant could not be purchased for less than £200, which sum would go a long way towards paying for labor for hand milking; but it was very seldom that a man who went in for dairying employed labor; it was generally where there was a large family of able milkers that dairy farming was carried out on a large scale. Then one had to take into consideration the cleaning of the machine, which usually took up about two hours of the farmer's time every week. If the milk from any particular cow was not normal, it passed through the separator without being noticed, and with hand milking the buckets were washed thoroughly after each milking. Where the machine was installed the farmer had to strip all the cows after the machine, and the cow also had to be milked by hand when she first came in, as the milk for the first few days was not wholesome. A general discussion followed the reading of the papers, and Mr. H. Storr gave an explanation of the working and cleaning of the machines, stating that he would not under any consideration revert to hand milking.

REDHILL (Average annual rainfall, 16.79in.).

September 4th.—Present; eight members and two visitors.

POULTRY KEEPING FOR PROFIT.—Mr. A. B. Leaney read the following paper:—“The management of the average farm flock of poultry is open to comment. With the exercise of a little more care and system a valuable sideline could be built up, and a sideline, considering the expense of outlay and the time spent in attention, which would rival any other on the farm. The labor involved is light and not monotonous, as there are always matters of interest in the growth of the young stock, &c. It is a labor requiring patience, and is generally carried on most successfully by the women-folk. Our climate is admirably suited for poultry, and we have not the expense of providing artificially heated houses in winter, as practised by some breeders in England and America. England is a large importer of eggs and dressed poultry, and now that the channels of supply from Russia are closed, Australia has a wonderful opportunity to build up a safe and substantial export trade. The only figures I have at hand show that in 1908 we supplied other States with 3,000,000 dozen eggs, valued at £127,000. Still farmers have no need to trouble about export. If guaranteed eggs can be dispatched to Adelaide there will be no difficulty in effecting sales. But it is the slipshod methods adopted by many farmers which tell against those who produce the good article. The practice of allowing the indiscriminate running of male birds with the hens, and collecting the eggs at any time, never mind whether they are good, bad, or indifferent, so long as they have a shell round them, is the chief factor which prevents the careful breeder from realising the full benefits of his labors. Although my experience has been chiefly with White Leghorns, matters in general will apply to the other breeds. The question arises, which should be the farmer's fowl—the light or a heavy breed? For egg production in amateurs' hands the White Leghorn cannot be beaten, and then there are the several heavy breeds to select from, which will supply a fair number of eggs and a plump bird for the table. As we are so far away from the Adelaide markets the expense involved in railing the birds puts the subject of breeding table poultry out of the question. And for that reason I am inclined to favor the White Leghorn to take chief place in the farmer's flock. The White Leghorn does not make a good table bird, but how many farmers care about poultry when there is plenty of beef, pork, and mutton to be had, and the difference in the egg-laying capabilities of this breed, compared with any of the heavier breeds, does not warrant them being replaced from holding the chief position as regards numbers. You can generally depend on the Leghorn beginning to lay a month earlier than the heavier breeds, and they are not so inclined to broodiness. In purchasing a breeding pen or cockerels for building up the standard of the flock, see that they conform as near as possible to the standard set for the breed. The cockerel which is to lead the breeding pen should be a sprightly and lively bird, possessing a bright eye, and built on stout legs standing wide apart. If he has

stamina he is sure to be a vigorous crower, an early riser, and generally the last to take his place on the perch. And it is the hen that is up early and late to roost which can be guaranteed to be among the chief performers in filling the egg basket. I now raise the question of the pubic bones as regards the laying possibilities of a hen. The hen which has a space large enough between the pubic bones to allow two fingers to be comfortably placed, and has a space between the pubic bones and the end of the breast bone large enough to admit the width of the hand, can be depended on to give a better record than a bird which has these spaces much smaller. The pubic bones and breast bone should be fine and not thick. If you have in the flock, which has been laying several months, birds which have distinctly yellow legs (in the case of White Leghorns), cull these out; it is the white or light-colored leg which supports a good layer. Ample protection from wind and rain, and proper allowance for ventilation, should be provided. If there are no trees or bushes for shelter, provide shade in the summer by nailing bags to a framework. Water must be kept from the sun, or sickness will invade the flock. Perches should not be higher than a foot or 18in. from the ground. If the fowls are enclosed, see that they are provided with grit in some form, especially shellgrit, from which they obtain the lime for making the eggshell. Charcoal crushed to the size of wheat or a little larger, and placed in tins, will be used by the fowls, which are thereby aided in keeping in good health. The average farmyard fowl is provided from year to year with only wheat or barley. By the use of a bran, pol-lard, and greenfeed mash in the morning, and wheat at night, an increase in the egg yield would be noticeable. In selecting eggs for placing under a hen or in an incubator, reject all those over or under sized and any that have a rough surface.

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The great advantage of the incubator over the hen comes in when you can bring the chickens out to suit your own convenience. The incubator is simple to manage, and the chicks are not so liable to lice, scaly legs, and other diseases as those hatched by hens with those complaints. Heavy breeds should be hatched in July and August, and up to the end of September. Light breeds can also be hatched in August; the greater majority try to get their last batches out by the end of September. It is safe to go up to the end of October, but after that the chicks have not the same chances of development as those hatched earlier in the season, and then they miss the flush of the high prices. About six months are allowed for the light breeds to start laying, although some pullets will begin a month or more before that. It is in March, April, May, and June that the highest prices rule for eggs, and you should aim at breeding pullets to lay at this period. It is generally believed that a mixture of crushed grains or crushed wheat on its own is the best for chicks. Experts condemn the use of cut-up boiled egg. No food should be provided to the chick until 48 to 60 hours after hatching. Nature has provided for them for this period. Clean water and tender, cut up greenfeed should be supplied. Feed little and often gives the greatest success. Kill all weaklings or you are running the chance of undermining the stamina of the flock later on. Growing stock should be well fed, and a change in the diet with the addition of oats with the wheat at this period is an advantage. Give plenty of meat. When the fowls come into laying, guard against over-feeding, as a bird that is putting on too much fat will be prevented from laying her full tally. If the fowls are well housed and well fed there will be little trouble with diseases. When the birds are moping about, and will not feed, and their excreta is a watery yellow substance, they are probably troubled with round worms. Administer to each bird by placing in the crop with the aid of a rubber tube one teaspoonful of turpentine or gasoline mixed with two teaspoonfuls of olive or cottonseed oil. Keep the birds without food for 24 hours before giving the mixture. Roup is a troublesome ailment. The fowls are sometimes watery at the eyes, or show a yellow pus on the eye. Remove the growth, and dust with powdered bluestone. A weak solution of bluestone in the drinking vessels (not iron or tin) or Condy's fluid will act as a preventive. Give the birds daily a teaspoonful of olive oil in which has been placed three drops each of eucalyptus and kerosine. Scaly leg can be cured by first scrubbing with warm water and soap, thoroughly drying, and applying a mixture of equal parts of olive oil and kerosine, or a paste made from lard and sulphur. Either of the mixtures will also eradicate chicken pox (warts on the comb) after the head has been washed with equal parts of water and vinegar and dried." A good discussion followed the reading of the paper.

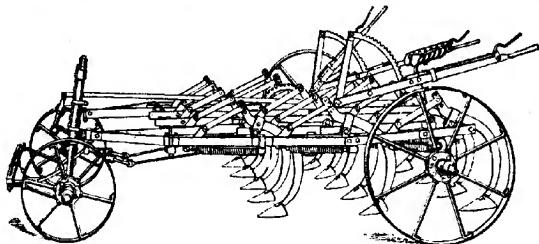
WHYTE-YARCOWIE (Average annual rainfall, 13.91in.).

August 19th.—Present: 10 members.

HEAVY versus LIGHT DRESSINGS OF MANURE.—The Hon. Secretary (Mr. E. J. Pearce) initiated a discussion on the subject of heavy v. light dressings of super for wheat crops, and read part of a paper by the Director of Agriculture (Professor A. J. Perkins), "How to Increase the Wheat Yields of South Australia." The Secretary said he believed it would be profitable to use heavier dressings than were common in their district, viz., 60lbs. to 75lbs. per acre. He advocated a minimum of 1cwt. Some years ago he conducted an experiment with small plots, which showed that 90lbs. gave the most payable results, so far as yields of wheat were concerned, but the extra 22lbs. would have the effect of increasing the pasture value of the land, and also build up the soil fertility for future crops. Mr. McGregor said that 90lbs. had proved most profitable on his farm. He thought possibly a very favorable season as regards moisture, such as the present, might show better results from heavier dressings. From that the question, "Does heavy manuring with super cause crops to burn off in the spring?" arose, and the Secretary thought the only way such an effect might be produced was by the moisture being insufficient to support the heavier growth produced by the increased quantity of super used; super did not affect the

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crop in the same way as farmyard manure. Mr. McCallum said in some districts farmers were still sceptical regarding the benefits of super, but his experiences in three different districts had confirmed him in the opinion that it paid to use from 90lbs. to 100lbs.

WIRRABARA (Average annual rainfall, 18.91in.).

September 2nd.—Present: 21 members and visitors.

RECLAIMING WASHOUTS.—Mr. J. Hollitt read the following paper:—“In paddocks where the land is more or less hills and slopes the water follows the hollows left by the drill and other implements. When the land is wet it leaves hollows for the water to run down, causing a lot of little gutters, and the further they run the deeper they become. The water continues down the slopes until it strikes a hollow or a rise which prevents it from following the tracks made by the implements. The water that collects follows the hollow or low-lying land, and washes deep gutters, which generally are of a winding or crooked nature. Very often the natural course becomes silted up, and the water overflows and makes other gutters, which render the land almost useless for cultivation. This can be prevented to a great extent if taken in hand in time. The water cannot at all times be stopped altogether, but a man or two with a team of horses, plough, and scoop can do a lot in a short time to divert the water into one straight line. A good thing to fill deep gutters with is porcupine. The porcupines can be ploughed up and then harrowed with a good heavy set of harrows to pull them on top of the ground. Then cart the porcupine and dirt that sticks to the roots, and place them in the gutter to within 6in. of the top, so that the plough will not pull them out when crossing. Sheaved straw is also good for filling gutters, and if care is taken to place the sheaves lengthways and tightly in the gutter it will be more solid than loose straw and will not sink down if the horses should tread on them. Do not put the straw so high that the share of the plough will pull it out when crossing, especially if the gutters are to be worked over soon after the straw has been put in. Cover the straw or porcupine with stable manure, rotten straw, or earth, as that will pass through the implements without choking them. A good implement for filling in small gutters and gutters that the horses will step over can be made out of an old scarifier. Take all the tines off, and leave the framework, axles, and wheels. The scarifier has to be lengthened, and this can be done with two beams of an old plough or any strong bars of iron, such as the side bars of an old reaper platform. Bolt these on to the frame of the scarifier, put a strong piece of iron across the back, then put the back axle of the scarifier near the back of the framework. The lever and rack will be needed to raise and lower the implement. Bolt a blade on to the back cross iron of the scarifier. This can be made from the rim of an old binder or harvester wheel. This implement is better than an earthscoop for filling in holes in new ground where trees or large stones have been grubbed out. It is only necessary to pick and shovel in the edges of the large or deep holes so that the team will walk over them when fallowing. Plough the land fairly deeply, then use the grader, and it will save a lot of hard work and make a good job, so that all kinds of machinery can be driven with safety over land that has been treated in that way. In the discussion that followed Messrs. Currow brothers advised planting paspalum in the gutters after they had been filled with earth. It would assist in binding the soil together and provide useful fodder.

GEORGETOWN. August 26th.—The evening was spent in inspecting and discussing various articles made on the farm by the chairman (Mr. J. McAulay).

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

GAWLER RIVER (Average annual rainfall, 17in. to 18in.).

September 5th.—Present: 11 members.

HAYMAKING.—In the course of a paper dealing with this subject, Mr. W. J. Thomas said in their district a fairly early variety of wheat was required for hay, and he considered the bill was well filled by King's Early. Of course, it was not advisable to have only the one variety, but rather an assortment—early, mid-season, and late wheats. The best time to cut hay for marketing purposes was from eight days to 10 days after the plants had flowered or when the grain was in the milky stage. For feeding on the farm a little grain was desired, so that the crop should be cut when the grain was in the doughy stage. Oats should be cut when the heads were turning a golden color, or even when the grain was beginning to get hard. It was a mistake to cut oats too green, as they were inclined to be bitter for the stock, and they were also difficult to tie with the binder. Stooking should be done as soon as the hay was cut, and made into round stooks of about 25 sheaves, not laid on the ground, but standing upright. The usual time allowed for hay to become fit to stack was 10 to 14 days after cutting, but that depended very largely on the weather. A good test was to take a sheaf from the middle of the stack and try to break it at the top joint. If it broke clean the hay was ready to stack. In hilly country the stack should be built up and down the slope of the hill to allow the water to get away on either side. A stack built as nearly as possible north and south would preserve the hay better in very wet districts. The following method of building the stack was recommended:—"Place the first row of sheaves butts out, and each succeeding row heads out until the middle is reached. Keep the middle well filled, and when the top is reached roof with the heads of the sheaves facing outwards. This acts as a thatch until the final covering of straw can be put on." A keen discussion followed the reading of the paper, in which the majority of members took part.

OWEN.

September 1st.—Present: 15 members.

FALLOWING.—In the course of a paper dealing with this subject, Mr. A. J. Freebairn said the land intended for fallowing should have a fire run over it, if there was sufficient straw to make a good burn. If the soil was black and could be ploughed to a depth of 3in. or 4in., summer fallowing could be started. The horses should be worked on the long yoke principle; commencing in the morning at about half-past 8 and working on until 3 o'clock. The ploughing could be left in a rough condition, and after seeding it could be worked with the scaringy harrows or cultivator. After that the sheep could be run on the fallow to keep the weeds in check. After seeding the main work of fallowing commenced, and the plough should be pushed forward without any loss of time before the heavy winter rains commenced. The land should be worked to a depth of 3in. with a pronged mouldboard plough. At the completion of fallowing the land should be worked with the harrows, and the cultivator then worked fairly deeply to destroy stinkwort. In the discussion that followed, Mr. T. Freelain favored spring fallowing closely followed by harrowing to make the surface of the land more even. In the event of rain falling after harvest, the fallows should be worked with the harrows. Mr. D. Freebairn referred to the advantages of the tractor over the horses, especially during fallowing time. He considered summer fallowing, where practicable, to be the most economical. Mr. J. Smyth stated that autumn fallowing was not an advantage, as the subsequent crop turned yellow and did not give a satisfactory return. He thought fallowing should be done during June and July. The land should be harrowed after summer rains, and the sheep kept on the fallow. Mr. F. Lake said one should be careful not to work the fallow down too finely in those districts where the land was likely to drift. Mr. W. Marshman expressed a preference for July

and August fallowing, because there was not so much danger of the land "running together." He also considered that late and lumpy fallow should be worked with the roller.

STOCKPORT (Average annual rainfall, 15.89in.).

September 6th.—Present: 15 members.

BALANCED RATIONS FOR DAIRY COWS.—The Hon. Secretary (Mr. E. Murray) read a paper. He emphasised the importance of the following points in the management of dairy cattle:—(1) An abundance of feed; (2) a balanced ration; (3) plenty of juicy food; (4) palatable food; (5) comfortable surroundings; (6) reasonable amount of exercise; (7) regularity, or systematic methods. The following rations were recommended by the writer:—Suitable ration for mature bull—3 parts corn and cob meal, 3 parts ground oats, 3 parts bran, 1 part linseed meal; in addition lucerne, maize, sorghum, or some other green fodder, also a fair amount of hay or chaff. Suitable rations for dairy cows—(1) Corn and cob meal, 200lbs.; bran, 100lbs.; oil meal, 315lbs.; 1lb. of this ration to every 2.5lbs. of milk. (2) Corn and cob meal, 250lbs.; crushed oats, 300lbs.; linseed meal, 100lbs.; bran, 300lbs.; 1lb. to every 6.8lbs. of milk. (3) Corn and cob meal, 250lbs.; crushed oats, 100lbs.; oil meal, 200lbs.; 1lb. to every 2.5lbs. of milk. (4) Crushed barley, 225lbs.; bran, 100lbs.; oil meal, 190lbs.; 1lb. to every 2.8lbs. of milk. Feed these rations along with lucerne, chopped maize, or chopped sorghum (green); let the cow have free access to water, and allow her to pasture in good natural grasses if possible.

WILLIAMSTOWN.

September 1st.—Present: 25 members

FOUL BROOD IN THE APIARY.—Mr. W. E. Greig read the following paper:—"I know of nothing in bee culture so much to be feared as foul brood, and if it once gets into an apiary it is extremely difficult to eradicate. It can be cured, but it is liable to reappear even a year afterwards. The symptoms are usually as follows:—Some of the brood fails to hatch. Cappings here and there are sunken and perforated at the centre. On opening one of these cells there will be found a dead larva lying on one side of the cell, somewhat shrunken and of a brownish color, varying from a light pale brown to a dark brown shade. In the more advanced stages the brown is of the color of a coffee berry after being roasted. In the incipient stages the brown is of the color of the coffee we drink when greatly diluted with milk. But so far all these symptoms may be present as the result of chilled, overheated, or starved brood. To determine whether it is the real foul brood, run a toothpick into the dead larvae and then draw it slowly out. If the matured mass adheres to the end of the toothpick, similar to spittle, and finally the fine thread breaks when the toothpick is drawn back, it is probably a case of foul brood. With all other forms of dead brood, with perhaps one exception, this ropiness does not appear; but with foul brood it is invariably a symptom. There is another symptom, and that is the odour. While not exactly foul, it resembles greatly that from a cabinetmaker's gluepot, and when the disease is pretty well advanced in the hive the odour will make itself manifest upon lifting the cover or quilt, even before exposing the brood. If other colonies are affected in a similar way, and the disease appears to spread, it is unquestionably a case of foul brood. I have referred to an exception where the diseased larvae have a brown color, and yet show the ropiness. This is a malady that will correct itself, and which is very apt to appear just before the honey flow during hot weather. It appears very suddenly, and disappears just as suddenly. It is not foul brood, because it does not spread, and it lacks the distinctive foul brood odour. Treatment of Foul Brood.—Having satisfied yourself of the presence of foul brood, or even having a suspicion that the disease is in some particular colony, prepare a clean hive containing only frames of foundation. Towards night shake all the bees from the diseased or suspected colony on to the frames of foundation, and

place the new hive on the stand of the old one. If possible the new hive should resemble exactly the old one, otherwise the bees will be confused, and carry the germs of the disease to other colonies. Compel the bees to use up the honey in their honey-sacs in drawing out the foundation. The diseased honey in the honey-sacs will be converted into wax, and the new product will be entirely harmless. The old combs of the hive should be burned. Do not try to economise by melting up the wax. You will not get enough to pay, besides you run the risk of spreading the disease all over the apiary. The old hive should be immersed in boiling water for at least 15 or 20 seconds. Splashing boiling water on it will hardly be sufficient. Painting the inside of a hive with a strong solution of carbolic acid may answer; but boiling the hives is effective. The hive, after being boiled, may be used again with perfect impunity for new colonies. I advise burning colonies affected, but be sure you burn every bee or the few that escape will get into some other hive and do more damage than the treatment recommended." The paper concluded with a scientific description of the disease.

CLARE, September 1st.—Mr. J. Scales gave a very interesting and comprehensive report of the operations and lectures given at the Farmers' Winter School at Roseworthy Agricultural College, which he attended as the nominee of the Clare Branch.

LYNDOCH, August 31st.—Mr. A. Kies gave a lucid and interesting description of his visit to the Farmers' Winter School at Roseworthy Agricultural College.

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NANTAWARRA, September 1st.—Mr. G. M. Herbert, who attended the Farmers' School at Roseworthy Agricultural College as a representative of the above Branch, gave an interesting account of the various lectures and demonstrations given during the various sessions. At the conclusion of the lecture the speaker replied to numerous questions.

ROSEDALE, August 9th.—Members from the Lyndoch Branch attended the meeting, and various subjects of local interest were discussed.

A further meeting was held on September 6th, when Mr. F. E. Waddy (manager of the Turretfield Farm) delivered an address, "Rotation of Crops."

SALISBURY, September 5th.—Twelve members of the above Branch and several visitors made a trip to Kilkenny and inspected the dairy herd and premises of Mr. H. H. Shillabeer, of "East View," Kilkenny, on September 5th.

TARLEE, September 4th.—Mr. D. F. Laurie (Government Poultry Expert) attended the meeting and delivered an address, "The Poultry Industry."

WATERVALE, September 4th.—The meeting discussed the question of the danger of stock grazing on public roads. A general discussion also took place on the subject "Spraying."

WILLIAMSTOWN (Women's), September 5th.—Mrs. R. Filsell read an instructive paper, "Yeast Bread and Cake Making." A number of samples were tabled by Mrs. Filsell. At the conclusion of the meeting the cakes were distributed amongst the members.

WINDSOR, September 27th.—The report of the delegates to the annual congress was received and discussed, and it was decided that the Branch should go into recess until after harvest.

YORKE PENINSULA DISTRICT.

(TO BUTE)

BRENTWOOD.

August 10th.—Present: 20 members and six visitors.

CARE OF FARM IMPLEMENTS.—Mr. R. Anderson, who read a paper dealing with this subject, expressed the opinion that a shed was most necessary for the housing of the implements. He preferred a building with stone walls and a thatched straw roof. He considered it a mistake to have a low iron roof on the shed. The open side of the shed should face in an easterly direction, so that the strong heat of the afternoon sun would not shine on the machines. When harvest operations were completed the machines should be overhauled, and placed in thorough working order for the next season. Before any implement commenced work all the nuts should be screwed up tightly, and by giving the woodwork of the machines an occasional coat of paint their life would be considerably lengthened. The ploughs and cultivators should be painted to keep them from rusting. The bearings and spindles should be regularly and thoroughly oiled and greased. An interesting discussion followed.

KILKERRAN.

September 5th.—Present: eight members.

BUILDINGS ON THE FARM.—Mr. C. F. Heinrich, who contributed a paper on this subject, said before any of the farm buildings were erected, the farmer should draw up a plan of the positions which the various buildings were to occupy. He considered that the appearance of the farm would be considerably enhanced if a square block of land, say eight acres in extent, was reserved for the homestead site, and all the buildings erected in a square position. One side of the block

should be reserved for the house and garden, the north side for the implement sheds, the east side for the stables, whilst the southern side could be used for plantations. If one side of the implement shed was left open, it should face the south, as the machines would not then be affected to any great extent by the weather. The stables and any buildings used for livestock should face the east, as that would shield the animals from the heat of the sun and the cold winds from the west. The homestead proper should be situated as near the centre of the property as possible for convenience in subdividing the land into paddocks that would adjoin the main farmyard. Water reticulations should not be placed close to any buildings, on account of the danger of leakages occurring which would result in the cracking of the walls. The writer considered it a mistake to place a tank near the kitchen door or any other building, when water could be run from the roofs to a small receiving tank, and run by gravitation to a larger tank, from which the water could be pumped by hand or windmill to the homestead or farm buildings. Mr. J. W. Cogan, in opening the discussion, thought the stables should face the north to protect the horses from the cold east winds. Mr. B. J. Koch considered that the implement shed should be enclosed on all sides. Mr. A. J. Cogan expressed a preference for self-feeders in the mangers to save time in feeding the horses. Mr. C. Heinrich did not like walls around the stable yards. He preferred trees, as they made the place more attractive, and provided shelter for the horses.

KILKERRAN.

August 25th.—Present: 10 members and two visitors.

ROTATION OF CROPS.—The monthly meeting was held at Mr. C. Heinrich's homestead, when members inspected the farm buildings and implements. Afternoon tea was provided by Mrs. Heinrich, after which a paper dealing with the subject "Rotation of Crops" was read by Mr. A. J. Cogan, in which the speaker stated that every farmer should adopt some system of cropping his land. He referred to the system adopted by agriculturists in other districts of the State, *i.e.*, the wheat-fallow system, and while he was not altogether in accordance with such a practice, he believed that the farmer, through various circumstances, had been forced to adopt that system in order to meet his obligations. In the discussion which followed Mr. Heinrich agreed with the writer on the statement that there was no reliable market for oats and barley, and considered that as time went on the holdings individually would become much smaller, as farmers would be cutting them up for their sons. Mr. Keightley favored a four-year rotation, *viz.*, fallow, wheat, barley, grass. Mr. A. Wakefield concurred, because generally a good crop of feed grew on barley stubble.

ARTHURTON, August 31st.—Mr. K. L. Roads gave a report of the proceedings of the Short Course for Farmers that had been held at Roseworthy Agricultural College. A paper dealing with the subject, "Closer Settlement," was read by the Hon. Secretary (Mr. T. H. Howlett).

MAITLAND, September 6th.—The monthly meeting of the Branch was held at Mr. E. R. Kelly's residence. During the afternoon members inspected the stock, sheds, implements, and general equipment of the farm. Afternoon tea was provided by Mrs. Kelly.

MOONTA, September 2nd.—Mr. H. Hughes, the Branch nominee to the Farmers' Winter School at Roseworthy Agricultural College, presented a comprehensive report concerning same, giving the salient points of the various lectures.

WEAVERS, September 4th.—Mr. F. Brundell, who represented the Branch at the Winter School for Farmers at the Roseworthy Agricultural College, gave an interesting report of the various lectures and demonstrations given by the officers of the college and the Department of Agriculture.

WESTERN DISTRICT.

BUTLER (Average annual rainfall, 16.61 in.).

September 4th.—Present: nine members and two visitors.

DESTRUCTION OF MALLEE SHOOTS.—Mr. N. G. Stewart, who contributed a paper dealing with this subject, said experience in dealing with mallee land had proved beyond doubt that running a fire over the land frequently and thoroughly was the best method of dealing with shoots. On considering the question of producing material for burning, the growing of oats was recognised as the best source. After the first fire, the new land should be worked thoroughly as soon after the burn as possible, and drilled early in the sowing season with 40 lbs. to 50 lbs. of oats, with a fair dressing of super. With good management and care and early burning the next year's problem to many, dealing with bush land at seed time, would not have to be faced. Again the land should be worked early, but the quantity of seed sown would depend on the amount lost during harvest, but another fair dressing of super should be applied to give the crop a better chance to grow a heavy straw to feed the fire. For complete destruction of shoots the writer advocated three oat crops in succession, and if the burning was attended to in the proper season the mallee would be well in hand by that time, and the land could be left out one year, ready for the plough the next fallowing. Another point was that too much stock, especially sheep, should not be carried before the bush was conquered.

Mr. C. F. Jericho also read a short paper on the subject, in which he stated that mallee should be rolled down, and if a good burn was secured the land should be lightly cultivated and sown with oats and 1 cwt. super to the acre. If the season was favorable a good burn would be assured. Next season the land should be sown with oats and $\frac{1}{2}$ cwt. super to the acre, which would provide sufficient straw to carry a good fire, after which the land should be free from bushes. The next year the land should be ready for the wheat crop.

A homestead meeting was held on September 14th at Mr. C. F. Jericho's residence, when about 50 visitors from the surrounding district took the opportunity of inspecting the Government experimental plots being conducted on Mr. Jericho's holding.

CARROW.

September 2nd.—Present: nine members and four visitors.

CARE OF FARM IMPLEMENTS.—Mr. A. Byrne, who read a paper dealing with this subject, said the present high prices of farm implements made it imperative that the farmer should look after and preserve the machines as much as possible. Shelter for the implements when not in use was most necessary, and the speaker advised the construction of a shed with stone walls and an iron roof. Many implement sheds, especially on Eyre Peninsula, were made with stump walls and straw roofs. These made excellent shelters, because they were very much cooler in summer than the iron structures. He did not advise brush sheds on account of the danger of fire. Any of the implements that were exposed to the weather for a considerable length of time should be given a coat of oil, and the same should apply to the woodwork wagon. The oiling of the bearings of the machines was another important item that should not be overlooked. Nuts and bolts should be screwed up tightly, and when the machine had finished its work for the season, it should be overhauled and placed under cover until next year. An interesting discussion followed, in which all members expressed a preference for the wood and iron building when the farmer was in a position to have such buildings erected.

EDILLILIE (Average annual rainfall, 18.45).

August 26th.

FARMING IN THE HUNDRED OF MORTLOCK.—Mr. T. C. Sachs, who contributed a paper under the title "Is there a Livelihood to be Made from the Deserted Properties in the Hundred of Mortlock?", said farmers who had taken up land

for wheat growing in the hundred of Mortlock had found that the growing of wheat could not be undertaken with profit, and had deserted their holdings. If another attempt was made to work that land, he said, mixed farming in conjunction with wheat growing should be tried. He considered that an area of 3,000 acres should be held by one farmer, and the land in its present condition would carry about 400 sheep. Three hundred acres should be put under crop every year, 100 acres each of barley, wheat, and oats. The stubbles should be burnt during February or March, and no dry cropping done under any consideration. If possible, the holding should be ring fenced and netting used for the boundary fence. Next, the property could be subdivided into six paddocks. All land not suitable for cultivation should be left for shelter for the stock, and would prove a beneficial change of feed for the sheep. If 2,000 acres were cleared and the roots carted off, it should carry about 700 sheep. The speaker favored the Merino sheep for that district. Cows and poultry, if given proper care and attention would also prove valuable side lines. The land provided good catchment areas, and ample provision in the form of dams should be made for water conservation.

GREEN PATCH (Average annual rainfall, 26.56in.).

September 4th.—Present: seven members and three visitors.

SOILS.—The following paper was read by Mr. C. J. Whillas:—“Soil is the upper layer of loose earthy matter of the earth's crust. It may vary somewhat in thickness, but on the average will run somewhere between 3in. and 12in. It can generally be distinguished from the subsoil by its darker color, due to its organic

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contents, humus, &c., whereas in the subsoil there will be very little organic matter. All soils have been produced by the breaking up of rocks, generally by the prolonged action of air, water, and frost, but not always from the rock immediately adjacent. The mineral or organic contents will be dependent on the rock from which it originated, but any complex rock, such as granite, will produce many varieties of soil. The geological agencies acting during great lengths of time separate and alter many of the minerals comprising the parent rock. The average composition of all soils is estimated to be very similar to that of the earth's crust, being approximately for the chief contents, silica (SiO_2), 53 per cent.; alumina (Al_2O_3), 19 per cent.; lime ($CaCO_3$), 6.3 per cent. So that soils on the average contain more than half silica. Owing to the varied characteristics upon which soils' fertility and usefulness depend, there can be no very satisfactory classification of soils, but the following is the one usually given in text-books:—Sandy, a silicious soil containing under 10 per cent. of clay; sandy loam, a silicious soil containing under 10 to 20 per cent. of clay; loam, a silicious soil containing under 20 to 30 per cent. of clay; clay loam, 30 to 50 per cent. of clay, balance mostly silica; strong clay, over 50 per cent. clay; marly, a soil containing 5 to 20 per cent. lime; calcareous, a soil containing over 20 per cent. lime; peaty, a soil containing over 5 per cent. vegetable matter. Clay is hydrated silicate of alumina ($Al_2O_3 + 2SiO_2 + 2H_2O$), generally colored more or less with oxides of iron. Many soils contain fragments of the parent rock in the form of gravel or boulders. Clean gravel can, of course, supply no available plant food, although it may analyse high in some. But a gravel may be of some physical benefit to some soils by improving their drainage. In a soil it is only the available plant food, plus the plant food that can profitably be made available by tillage or by adding something to the soil, that is of any benefit to the farmer. There may be less per acre of phosphates or potash in a soil that is so unavailable as to be quite useless. Fertility of soil is dependent upon many matters, the chief being:—
(a) Chemical Conditions.—Abundance of available or easily made available plant food and the presence in the soil of a base-like lime or alumina that has the power to retain some of the plant foods in suitable form for the plant. The chief elements that the soil has to supply for the plant are nitrogen, potassium, magnesium, calcium, iron, phosphorous, and sulphur. (b) The Physical Conditions.—Good drainage and porosity of the soil to the atmosphere are necessary; also a good soil has high power for the absorption and retention of both heat and water. This power increases with the clay or humus contents in a sandy soil. Drainage is a matter that will depend a good deal on the subsoil and on the contour of the land. (c) The Climatic Conditions.—In order to grow profitable crops, moisture, warmth, and sunshine are necessary. Be a soil ever so rich and fertile it must have the right climatic conditions to be of any use to the farmer. (d) The Bacteriological Conditions.—It is well known that bacteria play a most important part in plant growth by making the nitrogen of the humus available for the plant and by other actions in the soil not too well understood. Conditions in the soil for active bacterial action are warmth, moisture, air, the presence of a suitable base such as lime, and the presence of the ordinary mineral elements of fertility. A pure quartz sand containing nothing but silica would be a barren soil. It would contain no plant food, and would not be able to hold on to any that was added to it. But in nature most sandy soils would contain a little lime, clay, and humus, and this would make the soil more or less fertile according to the quantities. The lime in calcareous soils makes them warm and sweet, and supplies a most suitable base for retaining plant foods and for bacterial action. A red clay soil that is about half silica, and has a fair percentage of lime and humus, is likely to prove a splendid wheatgrowing soil if climatic conditions are right. A soil of this description responds to thorough tillage, and grows in this State heavy wheat crops before phosphates were used. The amount of moisture retained in a soil will, of course, depend a good deal on the nature of the subsoil. In a dry district with a deep sandy soil an impervious clay subsoil would be of great benefit by holding up the moisture within reach of the plants, but in a wet district the same subsoil on level land would probably waterlog the soil. Sour soil is due to too much water in the soil for too great a length of time. This turns the humus in the soil acid. Most farmers have a good practical knowledge of soils and how different varieties require to be treated to give the best results. Most farmers can pick out the good soil in new country by the natural vegetation.

growing on it, which is a sure guide. But when acquiring land either by purchase or selection it is wise to make sure what the soil and subsoil are by the use of a spade, for the soil is the main factor of success or failure to the farmer. He should not be satisfied with just a surface examination." Several other subjects, including "Fertilisers" and "Lambs for Export," were brought forward for discussion.

MOUNT HOPE.

September 2nd.—Present: six members.

DESTRUCTION OF RABBITS.—In the course of a paper dealing with this subject, Mr. J. J. Maloney first recommended poisoning rabbits about the end of October, when the feed had just commenced to die, with baits prepared with a poisonous preparation and pollard, to which should be added a little sugar and enough water to make it fairly stiff. To be more effective it was advisable to make the baits stronger than the directions on the poison container indicated. The baits should be distributed by means of a poison cart. The procedure should be carried out at intervals throughout the summer. In clearing out a wheat paddock it was advisable to use traps, because the feed was usually green at that time of the year, and the rabbits did not take the poison so readily. The traps that were to be used should be thoroughly overhauled, and only the strong-sprunged ones used. Weak traps only made the rabbits cunning. If any were hard to set off they should be filed so as to make them spring more easily. The paddock should be trapped in bands if possible. When starting a set, a mark should be made where the first trap was placed. As the following traps were set an arrow should be made

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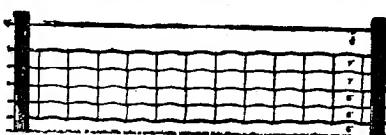


Fig. 7—Cyclone Spring Coil Sheep Fence.

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pointing in the direction of the trap that had previously been set. If the next trap was a short distance away a short arrow should be made, and a long arrow when the traps were placed some distance apart. When one bundle of traps was set another distinguishing mark should be made. When going around the traps a start should be made where the set was finished. It would then be quite easy to find the traps by means of the arrows made, each one pointing towards the next trap. It was also an advantage in having a mark at the end of each bundle, because if one was missed the trapper only had to go back over a few traps instead of the whole set. It also saved a lot of trouble by having them in bundles, because the traps could be left when the end of the bundle was reached, and by trapping the paddock in lands each bundle need only be carried a little way when the next set was commenced. As the land was trapped all the burrows should be filled in, so that when going over the paddock a second time it would be easy to see where to set the traps. By those means it was possible to clear a paddock so that no harm was done to the wheat by rabbits. A short discussion followed. The Hon. Secretary (Mr. H. F. Meyers) then gave a report of the Farmers' Winter School held at Roseworthy Agricultural College.

ROBERTS AND VERRAN.

September 7th.—Present: nine members and visitors.

HAYMAKING.—In the course of a paper dealing with this subject Mr. S. Simmons said a level piece of land, free from stumps and stones, should be selected from which to cut the hay crop. Next, the binder should be overhauled and placed in thorough working order. Oats should be cut when the straw was beginning to turn a purple color, whilst wheat could be cut a little on the green side, as stock would eat it better when the nutrient was distributed through the whole straw instead of being all in the ear, as was the case when the crop was too far advanced. Stooking should be performed about a day after the binder, and the hay left in the stocks for about 10 to 12 days before carting was commenced. Great care should be taken in stacking, especially if the stack was to be left any length of time. He preferred rounded ends to the stacks, because they could be built more quickly and with less trouble. The roof should be built with the heads of the sheaves facing outwards. If that was done the water would run off quickly, thereby eliminating the possibility of damage to the hay through the rain. In the discussion that followed, Mr. A. Cowley favored cutting the crop while it was fairly green, especially when wheaten hay was used, as it was then more palatable to stock. In building the stack, he said, the centre should be kept high, the slope increasing towards the top. He had had good results with a stacking floor of porcupine, which prevented mice from getting into the stack. Mr. C. Smith favored a raised stacking floor made of clay. Mr. H. Simmons expressed a preference for a stack with square corners. Mr. H. Smith thought the land should be rolled before using the binder. Mr. M. Masters said that the farmer should cut as much hay as possible and hold a reserve supply for bad seasons. The stacks should be made mouseproof and built facing the east and west.

TALIA.

September 9th.—Present: nine members and five visitors.

CEMENT CONCRETE.—Mr. H. A. Dolphin, who contributed a paper under the title, "The Uses of Cement Concrete," said there were many ways in which cement concrete could be used on the farm for the erection of serviceable and cheap structures, such as troughs, tanks, &c. The speaker stated that he had erected an overground tank with wire netting and cement, and it held water like a bottle. The tank was 5ft. high, and held 5,000 gallons. Describing the method of building the tank, the speaker said he first secured two hoops, in which he punched holes 6in. apart. Next pieces of matchboard, cut into 1ft. lengths, were nailed to the hoops to make a mould. Two pieces of wire netting were then placed around the

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THE AGRICULTURAL BUREAU.—Particulars of this Organization, of which every farmer should be a member, can be had on application to the Department.

mould and spliced together, the same being done to the bottom of the frame. He used a mixture of five of sand to one of cement. The first layer was placed in the bottom of the cage, and as the cement dried the mould was raised for the next layer. The cement was worked through the netting on the inside of the tank against the boards with a trowel. That method was followed out until the top of the tank was reached. The walls of the tank were from 2in. to 3in. thick, and were washed on both sides with pure cement. The speaker stated that if he built another tank he would use coarse gravel or shell grit to mix with the cement for making the walls. Finally a pipe and tap were inserted into the tank a few inches from the bottom of the tank. The speaker considered it would be advisable to dig a trench a few feet from the base of the tank and fill in with concrete to prevent the roots of trees from injuring the walls. Sheep troughs could also be made cheaply by using two planks of timber set in a V shape, and laying netting on them, and then setting in the concrete.

YADNARIE (Average annual rainfall, 14.09).

September 5th.—Present: 14 members and two visitors.

SUMMER VEGETABLE GARDEN.—Mr. T. H. Weiss, who read a short paper dealing with this subject, said a plot of land, securely fenced to prevent damage from stock and vermin, should be selected near the dam as the site for the vegetable garden. Five or six dray loads of stable manure should be carted on to the land and ploughed into a depth of about 8in. or 9in. For cucumbers and tomatoes, trenches 2ft. deep and 3ft. wide should be excavated, and the cucumbers set out 2ft. apart. Two rows of tomatoes 2ft. apart could be made in one trench, and in between the plants carrots could be sown. The plants should be watered not less than twice a week. A pump should be erected at the dam, and the water pumped into the tank, from which it could be taken to the garden with a hose. In the discussion that followed, Mr. Kruger did not think it advisable to use too much stable manure. He preferred bonedust, super, and sulphate of ammonia. He thought it would be better to use the windmill for raising the water out of the dam instead of a hand pump. Mr. Serotzki favored well-rotted stable manure and lime thoroughly mixed into the soil, and thought wind breaks to protect the plants should be provided. Messrs. F. and A. Jericho advised the use of a siphon when there was sufficient water in the dam. The majority of members agreed that in the district a plentiful supply of water was most necessary for the success of the vegetable garden.

A short paper, "Encouraging People to Invent," was read by Mr. F. W. Jericho, and an interesting discussion followed.

YEELANNA.

September 9th.—Present: five members and visitors.

CULTIVATION OF FALLOW LAND.—The following paper was read by Mr. K. Dunn:—"Our district has reached a stage of development at which we might with advantage take more trouble with working the fallow. Up to the present there has always been a certain amount of fear of 'takeall' which has prevented farmers from working their fallows properly. Farmers are beginning to realise that if they work their fallow judiciously there will not be much more danger of 'take-all.' We can place the soils of this district into three classes—(1) The chocolate loam and the red clay; (2) the red sand; and (3) the white sand. The chocolate loam and red clay soils should first be worked down level with heavy harrows, and then as soon as all the weeds have germinated the land should be cultivated once and then harrowed occasionally until harvest time. For the red sand I would not cultivate it unless it was impossible to kill the weeds with harrows. I advise harrowing it three or four times at intervals up till harvest time. The white sand, which is easy to plough and usually gets well turned over, is best left alone, and if weeds make an appearance the sheep and

cows can pick them off. In the working of the fallow much of the success lies with the implement that is used for cultivating. In my opinion a cultivator that just stirs the fallow up without turning it over, providing it is used often enough to kill the weeds, is better than the implement which turns the soil over, even though it is not necessary to go over the land more than once to kill the weeds. When using the cultivator on the fallow it is advisable to go as shallow as possible, as only the surface of the ground requires working."

COLLIE, September 2nd.—The Instructor for Mallee Lands (Mr. C. P. Hodge) attended the meeting and delivered an address, "Impressions of the Collie District." Mr. J. W. Lynch also delivered an address, "Farm Buildings."

ELBOW HILL, August 29th.—Mr. P. Wheeler gave a report of the proceedings of the Cleve Conference, and an address, "Irrigation on the River Murray," was delivered by Mr. McCutcheon.

KOPPIO, September 5th.—Mr. R. F. Richardson read an article, "The Border Collie: His Breeding and Training." In the discussion that followed, Mr. G. B. Gardner deplored the fact that so many sheep dogs fell victims to poisoned baits intended for foxes. Several members also spoke, and a good discussion on training sheep dogs followed.

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LAKE WANGARY, September 2nd.—Mr. T. P. Morgan read an article, "Best Type of Horse for Farm Work." Mr. A. E. Hawk also read a paper which was well discussed. The Hon. Secretary (Mr. T. H. Wood) tabled a sheaf of King's Red wheat, which was 3ft. 6in. high and of an excellent color. A programme of meetings was also drawn up, and the Branch decided to go into recess for the months of December and January.

MALTEE, August 31st.—Mr. J. O. Shorne read a paper, "Obsolete Machinery," in which he referred to the difficulty farmers had in disposing of their worn-out implements. He contended that if manufacturers would take back the old machines they would create a better demand for the sale of new implements.

McLACHLAN, September 2nd.—Mr. W. Attick read an article from the *Journal of Agriculture*, "Side Lines on the Farm," and an interesting discussion followed.

MITALIE, September 2nd.—Mr. H. R. Jacobs, who attended the 1922 Short Course for Farmers at the Roseworthy Agricultural College, gave an interesting report of the various lectures and demonstrations.

MINNIPA, September 1st.—Mr. R. Hill (manager of the Minnipa Experimental Farm) was present and delivered an address, "Wheat Selection."

PETINA, September 9th.—The meeting took the form of a debate on the subject, "Bulk Handling of Wheat." Mr. H. Howard spoke in support of the scheme, whilst Mr. O. Withall upheld the negative side of the question. Mr. Howard was judged the winner by the majority of members.

SMOKY BAY, September 2nd.—The monthly meeting of the Branch was held at Mr. E. Lovelock's residence. During the afternoon members inspected the manorial experimental plots that are being conducted on Mr. Lovelock's farm. Members were of the opinion that the heavy dressings of manure were showing signs of yielding the best crops. During the meeting which followed considerable discussion took place on "Wheat freights." The Hon. Secretary (Mr. G. O. Lovelock) read a paper entitled "Oats for Feed and Grain," and a discussion followed.

EASTERN DISTRICT

(EAST OF MOUNT LOFTY RANGES)

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

September 2nd.—Present: 12 members and visitors.

FARM MANAGEMENT.—In the course of a paper under the heading, "On the Farm," Mr. B. Schenscher expressed the opinion that in those districts where the holdings were small, the most important work on the farm was that of tilling the land thoroughly. He considered that under the above circumstances wheat-growing should prove a more remunerative occupation than the growing of either oats or barley, because the farmer was always certain of a market for the wheat. The horse was the most important animal on the farm, and should at all times receive careful and considerate treatment. If horses were bred on the farm an endeavor should be made to breed good animals to do the work on the holding. Sheep were also an important form of livestock to the farmer; their wool was a valuable source of income to the farmer, they provided the household with fresh meat, and by grazing on the fallows added a valuable form of manure to the land. The farmers should make a practice of selecting the best ewes of his flock, and mating them with a pedigree ram. If cows were kept for profit, they should receive proper care and attention. Pigs and poultry could also be made to yield a profitable income from the farm if managed on the right lines. Referring to the management of the outbuildings, the speaker said more care should be taken in keeping the stables and other buildings clean and tidy. Old manure heaps should

be removed, for they provided a breeding place for flies and other harmful insects. He also considered that each farmer should conduct experiments, and let his neighbors know the results, whether attended by either success or failure.

BRINKLEY, September 2nd.—An interesting discussion took place on the subject, "The Feeding Value of Cape *versus* Malting Barley." The delegates to the Bletchley Homestead meeting gave an interesting report of the proceedings of that gathering.

CLAYPAN BORE, September 4th.—An address dealing with the lectures and demonstrations given at the 1922 Winter School for Farmers at the Roseworthy Agricultural College was delivered by a member of the Branch.

GERANIUM, September 9th.—Mr. J. C. Prouse gave an interesting address, in which he dealt with the demonstrations that had been given at the 1922 Winter School for Farmers at Roseworthy Agricultural College.

HALIDON, September 6th.—The Hon. Secretary (Mr. L. B. Syman) read a paper from the *Journal of Agriculture*, "Sheep." Mr. C. H. Russell also read an article from a previous number of the *Journal*, "Selecting a Ram." Both these articles caused a considerable amount of discussion, and most of the members favored a four-tooth Merino ewe crossed with a Down ram. Incidentally the question was asked, "What is the best sheep-proof fence," to which Mr. C. H. Russell replied:—Posts $\frac{1}{2}$ chain apart, 2 Manners' droppers between posts, bottom three wires 6in. apart, fourth 7in., fifth 9in., No. 12 barb on top of posts.

LAMEROO, September 2nd.—The meeting was devoted to the reports of delegates who attended Pinnaroo Conference. A good discussion followed on the various varieties of oats, and which were the best for the Lameroo district.

LONE GUM AND MONASH, August 30th.—The Horticultural Instructor (Mr. Geo. Quinn) attended the meeting and delivered an address, "Sprays and Spraying," to a gathering of 48 members and four visitors.

NETHERTON, September 1st.—Mr. H. McLean gave an address, in which he described the proceedings at the 1922 Roseworthy Agricultural College Winter School.

PARILLA, September 1st.—The report of the delegates to the Pinnaroo Conference was received, and an interesting and animated discussion on the subjects, "Varieties of Wheat Best Suited to the District" and "Conservation of Fodder" took place.

PARILLA WELL, September 4th.—Mr. H. Davis, of the Pinnaroo Branch, attended the meeting and gave an interesting account of the demonstrations and lectures given at the 1922 Winter School for Farmers at the Roseworthy Agricultural College.

WAIKERIE, August 30th.—The Chairman read an article dealing with the subject "Black Spot," and an interesting discussion followed.

WILKAWATT, September 2nd.—Mr. F. R. Koch, delegate to the Pinnaroo Conference, gave an interesting report of the proceedings of the gathering. Several other subjects of local interest were brought forward for discussion.

WILKAWATT, September 30th.—Mr. W. H. Phillips gave a report of the proceedings of the annual congress, and several of the papers read at that gathering were brought forward, and an interesting discussion followed.

SOUTH AND HILLS DISTRICT.

BLACKHEATH.

September 1st.—Present: nine members.

SHEARING OPERATIONS.—Mr. W. J. Fym, who read a paper dealing with this subject, said he intended to deal with shearing operations as applied to the conditions of the Blackheath district. The first point that required attention

was the engagement of shearers, and, if possible, men should be engaged from one season to the next. The shed and gates should be placed in order and the floor washed with the aid of a stiff broom. Four presses should be conveniently arranged in the shed, one each for fleeces, first and second pieces, and locks. The wool table should be so placed that the man rolling the fleeces would be able to work in a good light and be able to move right around the table. Sheep should be dagged and have the wool clipped away from their eyes about six weeks before shearing commenced. The lambs should be weaned several weeks before shearing so that the ewes could be handled without any trouble. Ample grating was a provision that should not be overlooked, for in the event of rain a number of sheep could then be placed under cover. The writer did not think it advisable to skirt the fleeces too heavily when picking the wool, unless the wool was very seedy or burry. Another important point was that short, heavy, and greasy fleeces should not be placed in the bale intended for first fleeces. After the bales were sewn up, weighed, and clearly branded, they should be placed under cover. Dipping should be carried out, and the speaker preferred a long dipping bath and pushing the sheep's head under several times, thereby saturating the whole of the wool.

HARTLEY (Average annual rainfall, 15in. to 16in.).

September 6th.—Present: 11 members.

PETROL ENGINES ON THE FARM.—In the course of a short paper dealing with this subject Mr. P. V. Paech said the petrol engine was a great help on the farm, for such work as chaffcutting, pumping, and crushing could be performed without any trouble. The engine should be dismantled and overhauled at least once a year. Great care should be exercised when removing the piston rings, as they were easily broken. A simple method to adopt was to secure thin strips of tin about $\frac{1}{2}$ in. wide, with which the rings could be easily slipped off. The valves should be ground in, when the compression showed signs of weakening. Knife polish mixed with oil could be used for that work and the paste placed on the valve seat and head. The valve should be turned to and fro with a screwdriver and also lifted from the seat every six or seven turns. To obtain the most economical running from the engine it was most important that the mixture of air and petrol should be regulated correctly. The delegates to the Southern Conference also gave a report of the proceedings of the gathering.

LONGWOOD (Average annual rainfall, 37in. to 38in.).

August 26th.

A visit of inspection was paid to the Kuitpo Forest by member of the above Branch. Under the guidance of Mr. H. H. Corbin, B.Sc. (Consulting Forester and Lecturer in Forestry at the Adelaide University) and Mr. Durwood (Forester in Charge of Kuitpo), and the Chairman of the Meadows Branch of the Agricultural Bureau (Mr. Ellis), members were first shown the cut timber, and later witnessed the sawing cutting and squaring the logs. The forest was next inspected, and a description of the methods adopted in planting was given by Messrs. Corbin and Durwood. A history of the growth and planting of the forest was also given by Mr. Corbin. After luncheon the visitors inspected the nursery, where a further explanation of the treatment of the trees was given by Mr. Durwood. A further meeting was held on September 2nd, at Mr. A. Boyes' homestead. A demonstration of cleft and bark grafting and pruning was given, and an interesting and instructive afternoon was spent. Mr. Boyes provided afternoon tea.

RAPID BAY.

September 2nd.—Present: 17 members.

DAIRY FARMING.—Mr. J. Hamlyn read the following paper:—"The success of excellent butter making lies mainly in three factors. First, the farmer, if he wishes to produce quantities of rich produce, on payable lines, must have the best animals. Climatic conditions help to a large extent to mar or make the cow. My experiences have been chiefly with Shorthorns and Jerseys. The Jersey is the richer creamer of the two, but I think the Shorthorn makes up for this deficiency in its larger stature and heavier weight. It is of little use keeping old cows.

After, say, six milking seasons the cow should be placed in the market, and it is here that the Shorthorn will show to advantage. The second factor is care and feeding. Lucerne is a good fodder for the summer months. Maize is also an excellent crop, but it is improved when mixed with lucerne and allowed to wilt before being fed to the stock. For the cold winter months the beasts should be fed with warm and nourishing foods. A little bran and crushed oats mixed with a small quantity of chaff should be given at regular hours. Thirdly, comes the question of cleanliness. All utensils used should be kept spotlessly clean. If the separator is left dirty until the following morning a bad flavor is bound to come out in the butter. Above all, always remember a dozen cows well cared for will produce more than 20 uncared for animals."

ROCKWOOD.

September 4th.—Present: 18 members and eight visitors.

Mr. P. H. Kilsby, of Currency Creek, read a paper, "Breeding of Pure-Bred Stock," and in the discussion that followed Mr. Scott favored breeding pure stock. Mr. Collett said the farmer's only way to build up a herd of high standard stock was to secure a good sire that was backed up by good milking records. Mr. Steed was of the opinion that the scrub bull would soon be eliminated, and for a dairyman to be successful he must keep well-bred cattle. Mr. Bradford strongly favored pure-bred stock. He thought the seat of the trouble of having so many ill-colored cattle in the country was the crossing of the Jersey with the Shorthorn. The chairman (Mr. H. C. Dunn) did not favor the writer's idea that the bull was more than half the herd. In his opinion it was no use keeping pure breeds unless the farmer attended to the feeding of them. Good feeding was half the success in bringing up the standard of a dairy herd.

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UBAIDLA AND SUMMERTOWN (Average annual rainfall, 44.25in.).

August 7th.—Present: 10 members.

FACTORS IN RASPBERRY GROWING.—The following paper was contributed by Mr. Sharp:—“The raspberry is a fruit that must be well sheltered and protected from the wind and weather. When selecting a piece of ground, one should take into consideration the position of the land more than the class of soil, because very often the soil, while it will grow excellent canes, will not produce a good crop of berries. If possible the land should run from east to north, and be protected from the north and south winds. The north winds are most destructive to the raspberry blossoms. The ground should be broken up to a depth of at least 18in. The best time to plant out young canes is during August, when they will take root quite readily. There should be from five to six young canes to the bush, and they should be planted about 6in. deep, with 4ft. 6in. between the rows and 4in. apart in the rows when set out on a hillside. When planting on low ground and good soil, they should be 4ft. 6in. apart in the rows and 5ft. between the rows. Both the high and low canes should be topped back. The benefit to be derived from the topping of canes is that in the first place the bush always has dead tips right on the top. If the top is cut back it will throw out young healthy wood and the berries are always larger than if the bush is left untopped. Topping should be completed before the buds start to move out. The advantage of tying up the canes is that the fruit can be picked more easily, and if a heavy fall of rain is experienced the bushes and buds are not injured and the branches are kept up out of the dirt. I find it a good plan where the canes are very high to arch them over, to prevent the bushes from falling over one another. The ‘Fillbasket’ must be arched over. Always tie the canes up tightly and closely together. The best tie to use is binder twine that has been used on sheaves of hay. Flax is not to be recommended, because it will sometimes break before the picking is over. When cutting canes out, it is a good plan always to thin out the small young canes and only leave from 12 to 18 canes in a bush. It is not advisable to start digging canes too early, because in the event of a fall of rain the ground gets very hard and is difficult to work. The canes should be dug about August. Raspberries only require very little manure if planted in a suitable place. The best manure for canes is chemical bone-dust.”

A further meeting was held on September 4, when a general discussion took place on the subject “Methods of Marketing Produce.”

ASHBOURNE, October 14th.—Mr. C. H. Beaumont (Orchard Inspector and Instructor for Southern Districts) attended the meeting and delivered an address “Spraying of Fruit Trees.”

BALHANNAH, September 1st.—Mr. E. Leishman (Orchard Instructor and Inspector) attended the meeting and delivered an address “Manuring the Orchard.”

BLACKWOOD, August 21st.—Mr. A. K. Ashby introduced a discussion on the subject “Woolly Aphid.” The Branch decided to ask the Government to experiment in methods of eradicating the pest.

A further meeting was held on September 18th, when Mr. S. W. Chapman initiated a discussion dealing with “Red Spider and Woolly Aphid.”

CHERRY GARDENS, October 12th.—Mr. H. Strange delivered an interesting address, in which he gave an account of various places he had visited during a recent trip to Melbourne.

CLARENDON, September 25th.—The Dairy Expert (Mr. R. H. Suter) attended the meeting and delivered an address, “Dairying in the Hills.”

LENSWOOD AND FOREST RANGE, September 4th.—The following papers were read:—Mr. R. Hale, “The Stringy Bark Fruit Case”; Mr. G. Schultz “Bud Selection”; Mr. H. Schultz, “Care of Tools in the Orchard”; Mr. T. Hackett, “Growing Clover in the Paddocks”; and an interesting discussion followed.

MOUNT PLEASANT, September 8th.—Mr. V. R. Tapscott read a paper, "The Farm Vegetable Garden," in which he stated that every farm should have a plot of land devoted to the cultivation of vegetables. A well-kept garden added to the appearance of the property, and provided the homestead with a continuous supply of fresh vegetables.

SOUTH-EAST DISTRICT.

NARACOORTE (Average annual rainfall, 22.60in.).

August 12.—Present: 17 members.

HANDY DEVICES FOR THE FARM.—The following paper was read by Mr. J. D. Manton:—"The first thing I desire to draw your attention to is the anvil. Procure a piece of heavy railway iron, which will prove a good substitute for the anvil. Of course, there is no horn on it, but that is easily overcome by the use of an old worn-out axle. To make a blower take an old carbide tin, cut it around about 1ft. or 15in. from the top. Next cut an end out of some 1in. boards, and make a hole in the centre for the spindle to pass through. Fix this in the open end of the timber. This will make a drum. Now cut a slot in the end of the drum to take the spout. This can be made from a piece of galvanized iron tapered off to fit into an old axlebox. A spindle can be made with a piece of 3in. x 3in. hard wood, leaving one end long enough to turn down for a pully 4in. x 4in. made from a piece of galvanized iron and fastened to the spindle. Make a frame on which to fix the drum. The next thing is part of an old bike with the back wheel, driving wheel, and sprocket attached. Put a post in the ground and fasten this to the post. Procure a piece of kip about 1in. wide for a belt. This passes round the wheel of the bike and on to the pully of the spindle. Use one of the pedals for handle to turn and you will be surprised at the amount of draft obtained. The next thing we want is a vice. Put down a post, bolt or a piece of iron to come level to the top of the post. Get another piece of wood about 2ft. long with an iron plate bolted on to form the jaw. Put a bolt through this and fasten it to the post. Have another bolt through the post and the 2ft. piece of wood. By screwing this up you will have a very good vice. This can also be used for holding pipes, but the pipe is held between the two bolts to give it a good grip. Cut a small notch out of the post and 2ft. piece and screw up both bolts tightly. The next device we want is something to hold the harness whilst it is being stitched. Two staves of a cask should be obtained, and a 2in. block of wood placed between the ends, being careful to see that the other ends meet evenly. Next cut a hole in the bench to take the staves. Place the leather between the jaws. To Stop a Horse from Pulling Back.—Get a good bran bag. Put it around the animal's neck. Tie the two ends together, keeping it well back on the horse's neck. Then get a rope, fasten it to the bag, pass it around under the tail, and fasten it to the bag on the other side, and tie up with a strong rope fastened to the bag. Home-made Brooder.—First obtain a gin case. Make a small opening in the end for the chicks, and bore a few holes in the sides and ends for ventilation. Next make a false bottom that can be taken out easily to be cleaned. Keep the bottom sprinkled with ashes, and covered with chopped straw or fine dry grass for bedding, and renew this frequently. Make a lid for the box, and tack strips of woollen material close together all over it. These strips should be just long enough to miss the floor when the lid is shut. A stone bottle filled with hot water is put in at night or a flowerpot with a small lamp. A small netted run is needed to put down in front of the brooder on the grass or any suitable spot. In wet weather keep the chicks under cover. Emergency Wrench.—Procure a bolt which has a good long thread. Then run on two square fairly tight-fitting nuts. This can be adjusted to fit almost any size nut, and will be found a very handy tool on the farm. Gaspipe Wrench.—When it is desired to screw up or unscrew a pipe without damaging the surface, such as polished brass or nickelized pipe, the following wrench will do the work without leaving any marks, and is very simple to make. Take a piece of tough wood for the handle, to which is attached a leather strap with a loop to fit a trifle loosely on the pipe. Turning in the direction desired will cause a grip on the

pipe. In the discussion that followed Mr. F. Holmes said Mr. Manton had referred to a brooder for chicks, and advised the use of ashes in it as a good thing. They were not good to use, as the ashes got on the lungs of the chicks. It would be preferable to use fine sand or cockley chaff.

MOORAK.

September 7th.—Present: seven members.

AFFORESTATION.—The Hon. Secretary (Mr. J. F. Boardman), who read a paper on this subject, said every landholder in the Moorak district should plant a few trees each year, because they were an improvement to the farm, they provided shelter for the stock, they were a valuable asset, and finally the district was admirably adapted for afforestation. Pines grew quickly, they did well on light or sandy soils, and a ready market could always be obtained for the timber. In stressing the value of afforestation the speaker used the following illustration:—"Land that can be bought for £5 to £10 per acre will carry two sheep to the acre, and the sheep will return £1 per head per year. In 3½ years the land will return £60 per acre. If that same land is planted with pines, 90 trees to the acre, in 30 years the trees would be worth about £2 each, or a total return of £180 per acre." Continuing, he said the stringybark was another valuable tree, the timber from which could be utilised for building, furniture, and firewood. Stringybark trees were disappearing very quickly, and no provision other than natural regeneration was being made to meet requirements. The wattle was another very hardy tree, and when 10 or 12 years old it could be stripped for bark, which usually brought from £8 to £12 per ton. The timber also made excellent firewood. Care should be taken when planting out young trees to protect them from vermin and stock. Provision should also be made to guard against fire. He considered that for every tree cut down two should be planted, to provide a supply of trees for coming generations.

TATIARA (Average annual rainfall, 19in.).

September 7th.—Present: 16 members.

WHEAT.—In the course of an address on this subject Mr. W. F. S. Hulley traced the growth of the wheat plant through ancient history up to the present time of scientific methods of cultivation. The speaker gave an interesting account of experiments in cross-fertilisation and selection carried out by some of the scholars in the Murray Flats district. The lecturer produced an ingeniously constructed paper model of a wheat flower, with which to illustrate the processes of growth and fertilisation. Mr. Hulley also dealt with many of the diseases and pests of the wheat plant, and replied to a number of questions.

KALANGADOO, September 9th.—The meeting was devoted to a general discussion on several subjects, including diseases of stock and destruction of vermin.

KONGORONG, September 7th.—The meeting took the form of an open discussion on whether the Branch could make a district exhibit for Mount Gambier Show. It was unanimously agreed that we stage an exhibit, and the following agreed to act as a committee, with power to add:—Messrs. W. A. Aslin, E. E. Morrison, and E. Ashby, and Mesdames Houston and McNicol.

PENOLA, September 2nd.—Mr. S. Ockley contributed a paper, "The Winter School for Farmers at Roseworthy Agricultural College," in which he eulogised the work that was being done by the officers of the college and the Department of Agriculture for the benefit of the man on the land. The officers were then elected for the forthcoming year.

RENDELSHAM, August 9th.—Mr. W. R. Foster read a paper, "Ways and Means of Working a Branch of the Agricultural Bureau." A programme of meetings was drawn up for the year ending June, 1923.

RENDELSHAM, September 16th.—At the invitation of the Rendelsham Branch Mr. H. H. Orchard (Orchard Instructor and Inspector for the South-East) gave a pruning demonstration in the orchard of Mr. T. E. Carthew on the afternoon of September 6th. Twenty members of the Branch attended. Afternoon tea was provided by Mrs. Carthew, and in the evening Mr. Orchard read a paper, "Budding and Grafting."

